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Nerve Languages: The Critical Response to the Physiological Psychology of Wilhelm Wundt by Dada and Surrealism

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Nerve Languages: The Critical Response to the Physiological Psychology of Wilhelm Wundt by Dada and Surrealism

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For Jamie Lee, who made it possible.

Researching and writing a dissertation would be impossible and ultimately soul-destroying if it were not for the assistance and support that a young historian receives during the overall duration of the process. Presenting new research on the interrelationships of art and science is a tricky business that requires a certain type of dialogue between not only these two divergent fields, but also between ideas and data points that are better known and material with which the reader may be entirely unfamiliar. The readability and critical framing of the first three chapters is entirely the result of long conversations with Dr. Katherine Arens, which I will treasure in memory for the rest of my life. Having researched this material from a standpoint in the history of sciences—that is, outside the concerns of art history—Dr. Arens was able to convince me that steering into these foreign waters was beneficial and that a study of this kind would interest readers other than myself and my committee. She was also essential in encouraging me to consider modes of research, analysis, and writing that fell outside conventional art historical methods and assumptions which, I believe, created the foundations for everything new and fresh in the forthcoming pages. Her encouragement of starting from scratch and not relying on previous analyses, other than as comparative data points, was a major source of inspiration for both this project and other work since then, including my first major scholarly publication. I could never have written this dissertation without her generous contributions.

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artists in question. She knew I was onto something, but made me work to prove it to an outside reader, which made the thrust of the project what it is. The most difficult thing about writing a lengthy work that is the product of a lot of research is stepping outside one's own mind in a manner that lets the reader into the story that the author is telling. My original inspiration to consider the contacts between art and science was, like many other historians from my generation and earlier, inspired by Henderson's groundbreaking work on modern artists who were interested in science. There was no better critical reader of this material and my method than her.

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Nerve Languages: The Critical Response to the Physiological Psychology of Wilhelm Wundt by Dada and Surrealism

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The University of Texas at Austin, 2010

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Scholarship on Dada and Surrealism has established that psychology was a major intellectual source for artists in both groups. However, a burgeoning amount of recent work in both the history of art and of science indicates that types of psychology other than psychoanalysis permeated the historical context of the avant-garde. In the late nineteenth and early twentieth century, physiological psychology, for example, was the dominant science of the body and mind, which grounded psychic phenomena in structures of conduction in the nervous system. Modern artists saw within this discourse a fascinating and new theory of experience. In my selective history of the avant-garde's reception and response to physiological psychology, I will argue that artists worked within and partially according to the basic tenets of this discourse, but that they reshaped its superstructural projections away from formations and taxonomies of normalcy in consciousness and action.

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Introduction

On June 23, 1916, in a cramped, hot, smoky dive of a bar on a dingy backstreet in Zurich, a young man was carried onto a makeshift stage by his new friends: an Alsatian draft dodger, and a young Romanian Jew in flight from romantic intrigue. The man being carried onstage was neither some punk icon *avant la lettre*, nor was his immobility the product of strong drink or opium (he generally abstained from both, but smoked like a chimney). His motile limitations were due to his costume—a stiff cardboard construction that looked a bit like the offspring of a lobster and a muffler.

The young man's friends deposited him on a darkened stage in front of three easels, each of which had a transcription of a poem he was about to read. He first recited the poem on the left, then the right, and finished with reading the poem in the center. The first, a work called *Labadas Gesang an die Wölken*, also known simply as Wolken, contains the following lines:

The poet in question, Hugo Ball (DATES) did not think of these works as poems, but as sound poems [Lautgedichten], a new form of tonal modality involving the voice. His friends, the Alsatian artist Hans Arp and the Romanian poet and critic Tristan Tzara, were at work inventing other modes of new poetry. The work quoted above was likely named after Ball's friend Rudolf Laban, who ran a dance school in Zurich, and although he never participated with the Dadaists directly (his students did, however, extensively), he shared Ball's interest in spontaneity and new forms of performative gesture.

By this point, Ball had failed at everything he ever attempted. His dissertation on Nietzsche, abandoned. His work in the theatre was more prestigious, perhaps, but not enough to result in a stable position in any one city. He knew prominent artists and actors, such as the Russian painter and theorist Wassily Kandinsky, but the war dashed his hopes for concerted work with these figures, killed certain of his close friends (including Franz Marc and Hans Leybold), and would eventually force him out of Germany. Ball's life in Munich at this point resembles a bad joke—he could not even get drafted in that town. During WWI, that prohibition meant his health was atrocious. As an expatriate in Zurich, he led a miserable existence by working as a pianist and sketch writer for a small vaudeville troupe, and sometimes worked as an itinerant pianist for café owners who would begrudgingly allow him to play for tips. On that hot June night, Ball was thirty years old.

It is an age at which people often start to feel old for the first time, and Ball was certainly qualified to feel worn down. For the son of a traveling shoe salesman and a staunchly Catholic mother, he had reached the age at which the expectations began to seem overwhelming: a solid living, a home, possessions to fill it, and a family. Ball had none of these, and his only companion at the time, the actress and poet Emmy Hennings, had struggled with morphine addiction and purportedly had to resort to prostitution at certain points in her life. They were sickly. Scholars tend to heroicize these moments in the history of the avant-garde, because as comfortable bourgeois intellectuals, the hardships associated with being an artist are totally alien. That and everyone likes to retroactively root for the underdog. Ball's situation did not necessarily improve when he succeeded in talking his way into a position as entertainment director for a small café he renamed the Cabaret Voltaire; on the surface, his situation resembled his earlier work for vaudeville. But that was just the surface.

A very different work of art can provide the other bookend for the period under scrutiny. It is a small collage that is not terribly well-known, made by the German artist Max Ernst. He had been drafted, and suffered some badges of courage, albeit from rather mundane occurrences: a mule's kick and a cannon's recoil, basically both the result of being in the wrong place at the wrong time. Ernst's time in the military likely led to his abandonment of university studies and his participation in avant-garde artistic events, which led to his father disowning him. The work in question, *Sitzender Buddha*, looks like something from the rubbish bin of Viktor Frankenstein's laboratory. Ernst assembled appropriated images of cerebral anatomy that he clipped from various print sources, but the arrangement of images looks nothing like the human brain, but rather like some macabre cauliflower. Ernst intensified this feeling of mutation by drawing new organic elements in pen and ink that resemble cerebral channels or knots of nervous tissue, which creep across the printed images like some introduced species of ivy.

These two works are general examples of Dada, but appear to serve one another only as emphasis that the movement in question fomented heterogeneity as a way to avoid being co-opted by an art market that liked its art movements in neat little packages. Ernst's work contains imagery of brains mutating into forms that scientists would be hard pressed to classify in terms other than nightmarish. Yet the caricature of mental change Ernst represented in this work is deeply similar to what Ball sought in his performance, but understanding the ways in which that similarity exists requires a journey through a domain of psychology that has been forgotten or ill represented by historians of art. Within this similarity is a domain of critical address that, I believe, is a major dimension of avant-garde practice between the two wars. Like Dada, it has barely been understood.

Scholarship on Dada and Surrealism has established that psychology was a major intellectual source for artists in both groups. However, a burgeoning amount of recent work in both the history of art and of science indicates that types of psychology other than psychoanalysis permeated the historical context of the avant-garde. In the late nineteenth and early twentieth century, physiological psychology, for example, was the dominant science of the body and mind, which grounded psychic phenomena in structures of conduction in the nervous system. By carrying out thousands of different experiments on reaction time, reflex, or stimulus response, scientists in this field believed that they were establishing normative formulae of self-formation that contained neither phenomenological essences nor behaviorist guiding structures. Modern artists saw within this discourse a fascinating and new theory of experience. Yet they were suspicious that a single structure of the psyche's bodily substrate was destined to form in a system that was so open to continual reformation. In my selective history of the avant-garde's reception and response to physiological psychology, I will argue that artists worked within and partially according to the basic tenets of this discourse, but that they reshaped its superstructural projections away from formations and taxonomies of normalcy in consciousness and action.

The majority of psychologists in the first half of the twentieth century were physiological psychologists. The multifaceted discourses and theories in this field all drew on the writings of Wilhelm Wundt (1832-1920), on whom I focus as the major source for critical artistic approaches to the field's overall theories. Through the thousands of tests he conducted and, subsequently, by means of the dozens of psychologists he placed in universities around the globe, Wundt established both the popular idea that the psyche relied on nerves and the institutional practice of studying mental operation indirectly by experimenting on nervous reactions. These practices gave rise to a general culture of experiment and provided Wundt with

the bases for his theories of nervous formation and change, which he outlined in his landmark *Grundzüge der Phyiologische Psychologie* (1874), which served as a standard text for the discipline well into the twentieth century. In painstaking detail, this text established the reliance of thought patterns and communicative expression on mutable processes of nerves. Rather than relying on immanent ontological categories of mental operation that were above experience, Wundt based mental development on habitual modes of reaction and movement that rose from gradually established paths of nervous conduction in the body.

Wundt's theory that psychic formation relied on properties of conducted nervous energy through bodily tissues reflected a more general turn in nineteenth century European culture toward exploring new energy systems that were based initially on thermodynamics and were in reaction to the supposed threat of heat death. Pioneering discoveries such as Wilhelm Röntgen's x-ray (1895), J. J. Thomson's investigations of the electron, studies of radioactive material by Pierre and Marie Curie, and the development of wireless telegraphy further stimulated this popular interest in energy. The latter, in particular, focused attention on the ether of space, understood to transmit vibrating waves ranging from X-rays to the Hertzian waves of wireless telegraphy. Subsequently, early quantum physics and Einstein's theories of relativity, which would become popular in the 1920s, further highlighted the issue of energy. In the early years of the twentieth century, this scientific ferment contributed to the view that beyond the sensory world there existed what Linda Dalrymple Henderson has recently termed a "meta-reality" of pulsing energies and invisible dimensions.[1] To an individual living at this time, the nature of reality itself seemed to change on a daily basis, as breakthrough discoveries were disseminated in newspapers and popular science journals across Europe. Wundt's theories formed part of this popular face of science, because his major texts served as introductory college textbooks in

courses on psychology, philosophy, philology, and anthropology. Based on this fascination with new realities, both artists and the general public came to view space as a vibrating field of energy and rhythm.

Energy and rhythm were central concepts for Wundt, who investigated the human mind and nervous system in terms of qualitative and quantitative properties of vibration, conduction, and intensity. But unlike the new concepts of space and matter from physics, Wundt's theories of the nervous system placed mutable qualities of energy within a person's body as the basis of selfhood and created an inherently mutable subject position in which the self virtually overflowed with a mutating web of vibratory conduction paths that could shift with the introduction of new and unconventional movements. In a culture preoccupied with energy, Wundt's new view of the potentials within the moving and sensing self were particularly interesting to the early twentieth century avant-garde.

Wundt opened the first psychological laboratory in Leipzig in 1879, but the lab gives only half the story of Wundt's overall endeavor and of his place as an intellectual source in the late nineteenth and early twentieth centuries. Understanding what Wundt's ideas offered to radical artists requires attention to his fulsome theories of culture that grew out of his laboratory work. He differed categorically from the subsequent generation of psychologists who trained with him and contributed to the spread of physiological psychology in his belief that the mechanical and hermetic conditions of laboratory experiment could only tell a scientist so much about the bodily substrate of mental life, and that this small portion consisted of only the most rudimentary phenomena of nervous response, sensation, and perception. One sees throughout Wundt's long life a departure of his students from their teacher toward developing new experiments on higher mental functions like memory, the emotions, or volition.

Outside the laboratory, but always in its conceptual territory, Wundt turned his focus to culture in the twentieth century. Beginning in 1900 and ending in 1911, Wundt published ten massive volumes comprising a work titled *Völkerpsychologie*, in which he outlines and pursues his belief that the higher mental operations of a human being are (1) culturally inculcated and (2) historically relative. In its thousands of pages, he outlined how the history of the psychological development of the human race was based on different systems of movement—habitual practices of action and reaction among people that were based on a relatively similar structure of nervous conduction. Wundt connected his historico-philosophical projection to his earlier experiments on the mechanics of nerve formation and reformation that he had outlined decades ago in his *Grundzüge*. In a paradigm shifting connection of science to cultural history, Wundt argued that one could gauge the development of the human subject's mind as a point within a broader civilization by examining the cultural productions of the group, which consisted of language, art, myth, and customs of all kinds. Wundt's *Völkerpsychologie* was decidedly hypothetical, but the science on which its claims were based had decades of authority behind it.

In tandem with the lab, Wundt's *Völkerpsychologie* expressed a basic tenor of evolutionary mental development that one could perceive in the changing morphology of cultural production. The more specific nature of localized evolutionary trajectories made the development of mind far more relative to the shared action patterns of particular cultures from certain time periods. The conductive energies of a shared nervous morphology gave rise to different structures of collective endeavor within a certain historical context. Diversity of mental culture was Wundt's main focus. Normalcy of higher mental function was still a focus of labs across Europe, but this equally powerful theory established that a nerve-based psyche could be extremely diverse and depended on where one was in space and time. Thus, during the early

twentieth century, the *Völkerpsychologie* problematized the authority of the laboratory and its established discourse of normalcy from within the heart of its institutional boundaries.

Methodological Approach

On the rare occasion when extended discussions of Wundt's work appear in the humanities, scholars most often approach his work according to the methods of the French historian and critical theorist Michel Foucault (1926-1984) framed science. In his diverse studies, Foucault treated science as a discourse of power that structures knowledge and defines subjectivity—a view that many historians who study institutional science share. For example, studies by Anson Rabinbach, and Jonathan Crary operate according to the Foucauldian method of placing discursive chains into a broad epistemic field in order to determine the manner in which power relations are established and maintained. In *The Human Motor* (1990), Rabinbach has shown how this science established that a rational person was an organic and therefore knowable entity, like gravity or thermodynamics. That view had immediate applicability to studying how one might improve the normative output of the subject's labor power in the burgeoning industries of mass production. In several texts, Crary has analyzed psychological studies of attention as being symptomatic of its loss in an expanding culture of urban spectacle that fostered distraction.[2]

These three scholars have successfully undertaken institutional critiques that have made physiological psychology into an ideological keystone of modern industrialized Europe. But they have not addressed the way in which this field appeared to radical artists who picked and chose ideas that they frequently combined with other, often contradictory, notions from separate fields. Of course, making this claim cannot simply enable one to look past the politically charged nature

of science or any other discourse; indeed, this earlier scholarship was essential for my establishment and theorization of how the avant-garde reshaped the premises of this discourse.

When the avant-garde looked to physiological psychology, they recognized its problematic social place and worked within the discourse in order to undermine and divert its stated ambitions into radical forms of social reformation. In its original context, physiological psychology was more usable than restrictive. Its usability opened it into a field of opportunity for critical address, manipulation, and subversive, covert retooling of more than individual perceptions. In the light of science offering critical potentials, rather than unstoppable control, my study has benefited from the theories of Foucault's colleague, the French historian and theorist Michel de Certeau (1925-1986), who outlined methodologies that can augment or correct the more sweeping archaeological methods of Foucault. Certeau encouraged historians to focus on how people work within and often according to the basic causality of an ideological or restrictive discourse, but knowingly, in order to deviate from its more normative structures in a manner that undermines its stated intent to establish societal laws. He called this mode of practice a tactic, which is the general manner in which artists approached physiological psychology. Foucault himself offered a tactics of historiography that initially required withholding critical voices from the context under scrutiny. Certeau outlined why this silence made Foucault's work a departure point rather than a model: "If it is true that the grid of 'discipline' is everywhere becoming clearer and more extensive, it is all the more urgent to discover how an *entire* society resists being reduced to it, what popular procedures (also 'miniscule' and quotidian) manipulate the mechanisms of discipline and *conform to them only in order to evade them*, and finally, what 'ways of operating' form the counterpart, on the consumer's (or 'dominee's'?) side, of the mute processes that organize the establishment of

socioeconomic order." [3] In Certeau's model of tactic, one approaches a discourse with a knowing suspicion of its stated claims to objective authority and reshapes that discourse according to the base causality of its mainline epistemological conditions.

The approach of the Dada and Surrealist artists, in addition to other figures in this study occurred with a similar knowing suspicion of physiological psychology's stated claims to objective authority. These artists drew strength from each other in their shared desire to confront society in a manner that reshaped its basic conditions of experience. Artists took the two basic ends of Wundt's overall developmental trajectory—new motion and cultural production—and combined them in order to explore how new motor activity among a small group within a context of cultural production had the potential to alter consciousness. My study will show how artists worked within the discourse of physiological psychology in a manner that openly challenged its claims to authority.

In situating Wundt's theories alongside responses from selected members of the avant-garde to this psychology, I faced a problem that scholars who focus on the relationship between radical art and science often face: why would a group of artists, whose interests are decidedly anti-positivist, be interested in this branch of psychology, which has long since come to stand as a pinnacle of positivist approaches to the mind?[4] In addition to this question, I had to confront another, perhaps larger question: How did the artists' approach to this science differ from their contemporaneous interest in psychoanalysis? Answering both of these questions will depend on how one frames the nature of the discourse itself. Physiological psychology contained within its supposed objectivist tenets the gateways to its own reshaping; it provided major guidelines for how experimental application of new forms of gesture and movement could alter the contents of one's psyche, rather than simply illustrate its pre-existent conscious or unconscious structures.

State of the Literature on Wilhelm Wundt in Art History

Art historians have often touched on Wundt's theories as a subject of interest for the international avant-garde, but have never acquainted the reader with a basic outline of his theories in historical and intellectual context. This omission makes him into a sort of ghost of Modernism; he is there, but in an ephemeral way; a name cited, a couple basic ideas mentioned, and nothing more. But given the diversity of these connections, it would appear that it is high time for a focused examination of Wundt's theories, coupled with a more in depth analysis of how certain artists critically reshaped his work.

Unsurprisingly, Wundt's ideas pervaded the German-speaking world. Both Corinna Treitel and Daniel Cottom have described how he lent a dissenting voice to debates on spiritism, which was a major avant-garde interest.[5] In her study of the German art historian Alois Riegl, Margaret Olin has established Riegl's intellectual debt to Wundt.[6] Both Robert Brain and Juliet Koss have connected Wundt's work to the interest that German cultural figures like Wilhelm Worringer and Georg Fuchs had in debates on phenomena of empathy.[7] In a recent study on Kantian theories in art, Mark Cheetham notes that the German art dealer Daniel Henry Kahnweiler, Picasso's first dealer in Paris, was a close reader of Wundt's work and used his theories as an intellectual source for his writings on Cubism.[8] In his studies of more critically minded German intellectuals of the 1920s and 1930s, Frederic J. Schwartz recently established Walter Benjamin's indebtedness to Wundt's theory of apperception in the composition of his landmark 1935 essay "The Work of Art in the Age of its Technical Reproducibility." More recently, he has connected Wundt's ideas on apperception to the deeper interest among critical thinkers like Siegfried Kracauer in phenomena of distraction.[9]

In the context of Russian art, Charlotte Douglas was one of the first scholars to note Wunt's important role for the avant-garde, who encountered his theories through both primary sources and secondary literature.[10] A center point of this transmission was the physician Nikolai Kulbin, who was close to artists and was able to offer more user-friendly versions of Wundt's complex theories. Henderson has noted that P.D. Ouspensky's *Tertium Organum* owes a significant debt to Wundt's notion of "sensory feeling," or the notion that the senses have a pre-conscious unity. Gerald Janacek has outlined how basic ideas from Wundt's *Völkerpsychologie* diffused through the popular press in Russia during the first two decades of the twentieth century, where Russian poets including Mayakovsky and Khlebnikov read about and incorporated these theories into the development of radical poetry.[11] Another Russian artist who read Wundt was Wassily Kandinsky, whose uncle translated Wundt's work into Russian in 1911-1912, which coincided with the publication of his *Blau Reiter Almanak* (which included an essay by Kulbin), in addition to acquainting non-Russian artists like the Dadaist Hugo Ball with the recent work of the Russian futurists. According to John Gage, Kandinsky's interest in synaesthesia was likely fueled by Wundt's discussion of it in relation to Goethe's earlier theories of color, which he reinforced with current scientific authority.[12] Margaret Olin has suggested that Wundt's rejection of hierarchy between vision and touch, coupled with Wilhelm Worringer's focus on tactility in his theories of empathy, provided major intellectual sources for both Kandinsky and Gustav Klimt.[13] The diverse outlooks of these figures from the history of culture and the frequent contacts that many of them had with each other illustrates the sheer international scope of connections to Wundt's work and its usability by many different artists.

Outline of the Dissertation

This study differs from uses of other psychological methodologies in that I cannot guarantee reader familiarity with Wundt's ideas. Thus, the first two chapters will introduce a selection of Wundt's most prominent theories. The first chapter outlines Wundt's ideas from his *Grundzüge der Physiologischen Psychologie* (1874) on rudimentary nervous function and the way in which he plotted the relationships among bodily movements, the senses, and psychic function. My goal is to introduce in as clear a way possible how Wundt understood the mechanics of the nervous system. These mechanics formed the focus of his lab experiments, which had a particular social dimension of testing and usage of instruments that is necessary for comprehending how situating these theories in a particular social dimension facilitated the social view of psychological objectivity. Based on this context of experiment, Wundt made the key argument that one could not test higher mental functions, which were the subject matter for comparative analyses of cultures.

The second chapter introduces selected concepts from Wundt's *Völkerpsychologie*, which was his response to queries of how one should study higher mental functions. In particular, I focus on how Wundt discussed the mentality, language, and art of so-called "primitive" cultures, which remains an essentially unexplored source of interest for the avant-garde fascination with non-Western cultures. Intriguingly, Wundt's notion of primitivism connected the mental level and horizons of primitive experience to particular systems of movement. In order to establish the popularity and applicability of Wundt's *Völkerpsychologie* in the historical context, I will construct a comparative analysis of different approaches to this work by Emile Durkheim, Franz Boas, and Wilhelm Worringer. In particular, it was Worringer who provided avant-garde artists with the idea that mental change through an alteration of nerves was most potent when it was undertaken by a small group of like-minded individuals or a subcollective. In contrast to the

individualist orientation of empathy, Worringer drew on both the theories of German art historian Alois Riegl and the *Völkerpsychologie* in order to present his own version of this Wundtian method and define abstract art as a new form of subcollective movement that could yield new forms of thought among a group, rather than an individual stylistic endeavor of the plastic arts. Both the first chapter and this one will therefore establish the discursive presence of Wundt's thought.

The third chapter establishes the popularity that the reshaping of Wundt's theories in this fashion had throughout Europe, a prominence that did not begin or end with Dada and Surrealism. One route of diffusion that Wundt's ideas took was through revolutionary approaches to musical pedagogy and choreography. The first of these approaches I examine is the life work of Emil Jacques-Dalcroze, a Swiss born musical pedagogue, who taught a heightened sensitivity to rhythm by having his students undertake courses in which they moved in certain ways to specific sequences of rhythm. His systems of eurhythmics drew extensively on basic Wundtian theories of nervous change. He also drew on the notion from the psychologist's later *Völkerpsychologie*, that collectively changing the nature of the nervous system promised to give rise to new forms of orientation to pre-existent cultural production. Foremost among the Dalcroze theories that I shall spotlight is the power that collective movement (*Turnen*) had to shift nervous conduction paths as the initial stage of nervous reeducation. Dalcroze sought to use his method to reorient his students to pre-existent forms of music. More radical users, by contrast, used his methods to orient bodies to rhythms of a different sort. For example, the Austrian philosopher and occultist figure Rudolf Steiner read Wundt's work critically and used it as the basis for his belief that collective group movement could build organs of higher perception in a person's body that allowed them to witness higher, occult realities that they could then

communicate to an audience through the group movements of Eurhythmie. In addition to Steiner's radical use of eurhythmics, the German Rudolf von Laban was a choreographer who used Dalcroze's theories to equally revolutionary ends with the help of former Dalcroze students Suzanne Perrottet and Mary Wigman. As many scholars know, Laban's students had extensive contact with members of the Dada movement in Zurich and it is my contention that one of the motivating factors for this contact was the approach to movement that both groups had, which drew on a radical reading of Wundt's work.

Dada, of course, was very different from Laban's overall artistic program and other approaches to rhythmic group movement in Switzerland, which all utilized techniques of ascendant complexity in the building of new harmonious practices and social reform. Thus the fourth chapter will outline how members of Zürich Dada did to Laban's theories what Laban did to Dalcroze; they selectively borrowed, reshaped, and intensified certain tenets and practices according to the common intent to reshape the bodily substrate of mental life in and through the sphere of cultural expression. Foremost among these practices is improvisation. In addition to plenty of evidence detailing contact with Wundt's ideas, period texts by Dada artists indicate connections of artistic endeavors to physiological psychology that utilize its basic causal structures to rebuild the expressive minds of the group's members. Out of collaborative and improvisational movement, one may read Zürich activities as an ironic reenactment of laboratory experiments that took place in Leipzig, both in terms of the focus on arbitrary movement and the collaborative social dimension of expression. Only in Zürich, artists sought to change the group, rather than classify it.

The fifth and final chapter explores the impact of Zürich Dada on the artistic practice of the German artist Max Ernst. I frame his early graphic work and collages from the early 1920s as

enacting a dual mode of engagement with Wundt's ideas. On the one hand, Ernst's contacts with both Arp and the Dadaist Kurt Schwitters inspired highly polished graphic works that are built out of improvisational coordination of different graphic processes that one may frame as a cultivated discord of bodily movement. On the other hand, Ernst created powerful visual representations of physiological otherness in his collages of twisted organs and mutating anatomy. I then move on to consider his contacts with Zürich Dadaists during his time in the Tyrolean Alps in which he collaborated on improvised collages and texts, in addition to inventing his well-known method of frottage.

Ultimately, my goal for this dissertation is to acquaint the reader with a dimension of psychology that has received rather one-sided treatment in the humanities, if it has appeared at all. Scrutinizing these theories offers a new way to understand gesture and artistic creation as it relates to the psychology of twentieth-century culture. In a broader sense, this study seeks to provide a demonstration of the way artists utilized science critically by reshaping its tenet to suit their political and creative needs. It is also my hope that this study will invigorate continued interest in forms of psychology other than psychoanalysis and thus will give scholars in the humanities a fuller sense of how artists approached expression and the mind.

[1] Linda Dalrymple Henderson, "Reintroduction," *The Fourth Dimension and Non-Euclidean Geometry in Modern Art* (Cambridge, MA: MIT Press, 2010). I would like to thank Dr. Henderson for sharing this unpublished work with me. See also Henderson and Bruce Clarke, "Introduction," *From Energy to Information: Representation in Science and Technology, Art and Literature*, (Stanford: Stanford

University Press, 2002), 1-15; See also Bruce Clarke's introductory essay "From Thermodynamics to Virtuality," 17-34 and Henderson's essay in this volume, "Vibratory Modernism: Boccioni, Kupka, and the Ether of Space," 126-150.

[2] Jonathan Crary, *Suspensions of Perception: Attention, Spectacle, and Modern Culture* (Cambridge and New York: MIT Press, 2001). See also *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge and New York: MIT Press, 1992). In *Suspensions*, Crary addressed Wundt in relation to one facet of his work on cognition. Crary's Foucauldian archaeology documents Wundt's attempt to study and define attention in the midst of its decided dissolution by a rising society of spectacle. Crary follows Foucault's view of science as a symptom of anxieties before an encroaching capitalist system of spectacle takes for granted the categorical view of science as what Norbert Elias called an orientationalist control structure and thus relies on a very common view of science in cultural studies. For example, consider this passage from Norbert Elias on scientific discourse: "The central social function of knowledge is that as a means of orientation. As the individual orientation of every member of a society depends on the means of orientation available there, groups of people who are able to monopolize the guardianship, transmission, and development of a society's means of orientation, hold in their hands very considerable power chances, especially if the monopoly is centrally organized" (Elias, "Scientific Establishments," in Elias, Martins, and Whitley, eds., *Scientific Establishments and Hierarchies*, [Dordrecht, D. Reidel, 1982], 37). Elias seeks a top-down historical structure for the place of science in culture that most institutional histories of science reinforce.

Foucauldian methods in scholarship that examine art history and science offer a potent and intriguing premise that seemingly radical artists actually replicate social ideologies in their work, often unwittingly, based on their openness to new forms of science. Two problems exist in this method. First, one must accept the authority of the strategy and assume that the artist was not aware of the problematic nature of the discipline in the context and consumed it regardless of ideology. Second, one must accept that transparent application of scientific orthodoxy is the only available option for artists who are interested in science. These two problems hinge on seeing a use of science as a diffusion of its normative ideologies.

[3] Michel de Certeau, *The Practice of Everyday Life*, trans. Steven Rendall, (Berkeley, Los Angeles, and London: University of California Press, 1988), xiv.

[4] I drew strength for my inquiry from Gavin Parkinson's groundbreaking study of the Surrealist approach to quantum physics, in which he faced the same question. Gavin Parkinson, *Surrealism, Art, and Modern Science: Relativity, Quantum Mechanics, Epistemology* (New Haven and London: Yale University Press, 2008). A reader familiar with this work will also likely notice that I followed the general manner in which

he planned his study, simply because I believe that it is the best way to introduce someone in the humanities to material from a discipline with which s/he may be relatively unfamiliar.

[5] Daniel Cottom, *The Abyss of Reason: Cultural Movements, Revelations, and Betrayals* (New York and Oxford: Oxford University Press, 1991), 35. Corrina Treitel, *A Science for the Soul: Occultism and the Genesis of the German Modern* (Baltimore and London: Johns Hopkins University Press, 2004), 11-13, 21-22.

[6] Olin, "Forms of Respect: Alois Riegl's Concept of Attentiveness," *Art Bulletin* 71 (June 1989): 285-299.

[7] Robert Brain, "The Pulse of Modernism: Experimental Physiology and Aesthetic Avant-Gardes c. 1900," *Studies in History and Philosophy of Science* 39 (September 2008): 393-417; "Protoplasmania: Huxley, Haeckel, and the Vibratory Organism in Late Nineteenth Century Science and Art," in *The Art of Evolution: Darwin, Darwinisms, and Visual Culture*, ed. Larson and Brauer, (Dartmouth: 2009): 92-123. I would like to thank Dr. Brain for being so open with me about his ongoing book project that will be a fuller study of the material in these articles. Personal correspondence, Spring 2009. Koss, "On the Limits of Empathy," *Art Bulletin* 88 (March 2006): 139-157.

[8] Mark Cheetham, *Kant, Art, and Art History: Moments of Discipline* (Cambridge and New York: Cambridge University Press, 2001), 78. Cheetham calls Wundt a neo-Kantian but it will be made clear in the following pages that he anything but. Also in the French context, scholars of post-impressionism have long since established the interest Georges Seurat had in contemporaneous French theories of perception by the scientist Charles Henry, which rely in part on Wundt's studies of perception and those of Hermann von Helmholtz. It has long been known that Sonia and Robert Delaunay also read the works of Henry. See Paul Vitz and Arnold Glimcher, *Modern Art and Modern Science: The Parallel Analysis of Vision* (New York: Praeger, 1984), 85-87. See also Robert Herbert, "'*Parade de cirque' de Seurat et l'esthetique scientifique de Charles Henry*," *Revue de l'art* 50 (1980): 9-22; cited in Crary, *Suspensions*, 163. See also Herbert et al, *Georges Seurat, 1859-1891*, exh. cat. (New York: Metropolitan Museum of Art, 1991). Gordon Hughes has recently established in further depth how Robert Delaunay drew on physiological psychology for his interest in visualizing simultaneity and inner perception in his optical disc pictures. See Gordon Hughes, "Coming Into Sight: Seeing Robert Delaunay's Structure of Vision," *October* no. 102 (Fall 2002): 87-100; "Envisioning Abstraction: Robert Delaunay, Modern Perceptual Theory, and the Development of Abstract Painting" *The Art Bulletin* 89 (June 2007): 306-332.

[9] Schwartz, "The Eye of the Expert: Walter Benjamin and the Avant-Garde," *Art History* 24 no. 3 (2004): 401-444; *Blind Spots: Critical Theory and the History of Art in Twentieth Century Germany* (New Haven: Yale University Press, 2005),77-79

[10] Charlotte Douglas, "Malevich and Western European Art Theory," in Petrova et al, *Malevich: Artist and Theoretician* (Paris: Flammarion, 1991), 58-59.

[11] Gerald Janacek, *Z@UM: The Transrational Poetry of Russian Futurism* (San Diego State University Press, 1996), 15-21.

[12] John Gage, "The Psychological Background to Early Modern Colour: Kandinsky, Delaunay, Mondrian," in Lynton et al, *Towards a New Art: Essays on the Background to Abstraction* (London: Tate, 1980), 24-37.

[13] Margaret Olin, "Validation by Touch in Kandinsky's Early Abstract Art," *Critical Inquiry* 16 (Autumn 1989): 144-172. In addition to these connections, Shelley Wood Cordulack has recently established convincingly that Wundt was one of many sources for Edward Munch's interests in physiology and symbolism. *Edvard Munch and the Physiology of Symbolism*, (Madison, NJ: Fairleigh Dickinson University Press, 2002), 51.

Chapter 1

Nerves, a User's Guide: Wundt's Theories of Elemental Nervous Change

"He never learned to play." – Edwin Boring on Wilhelm Wundt[1]

Wilhelm Wundt published the first edition of his *Principles of Physiological Psychology* (*Grundzüge der Physiologischen Psychologie*) in 1874, and the work was subsequently revised and updated six times by 1911. Born in 1832 to a Lutheran minister, Wundt began his scientific training in 1851. Throughout his long career, he established myriad experimental methods for studying the activities and formation of consciousness by examining physiological processes in the human anatomy and nervous system. In doing so, he drew on the field of experimental physiology that was in full bloom during the second half of the nineteenth century in the different work of Johannes Müller, Gustav Fechner, and Hermann von Helmholtz. These three scientists had established the study of human physiology as an experimental discipline that was on the same level as physics. Wundt's revolutionary gesture was to take this method of inquiry and carry it over as the means to comprehend psychic processes.

He spent a crucial semester in 1856 studying with Johannes Müller (1801-1858), the early pioneer of experimental physiology.[2] Müller's major contributions to the developing field of physiological psychology were his laws of specific nerve energy that appeared in his gradually published *Handbuch der Physiologie des Menschen* (1833-1840). The essential tenet of these laws was that one is not directly aware of an object, but rather is only directly aware of an overall experience that nerves cause. Müller argued that nerves are the intermediaries between perceived objects and the mind.[3] He thought

that five different kinds of nerves filled the human body—one for each sense. Each type of nerve transmitted a particular kind of nervous energy that registered in the mind as a specific sense quality. The details of experience would determine the nature of how these nerves interacted. For example, if one witnessed an explosion, the noise and flash of light would generate separate qualities in the mind that are transmitted by different nerves. Thus, the quality of a sensation will depend on what particular nerves are triggered into servicing the brain with data. Müller made the nervous system into the key interface between self and world. It was *the* active force in determining how experience and thought came to exist, and his view enabled greater interest in phenomena of cerebral localization, or the different ways in which distant nerve paths meet in the brain.

Major publications on the human mind and senses appeared during the 1860s that fed Wundt's interest in this gradually emerging field of physiological psychology. In addition to the works of Müller, he devoured the psychophysical theories of Gustav Fechner (1801-1887), whose 1860 text *Elemente der Psychophysik* posited a functional relationship between body and mind based on measuring thresholds of stimulus response.[4] Fechner was a mathematician, physicist, and philosopher who tried to measure the energy of a mental event in coordination with levels of physical intensity and ultimately sought to link these energies to degrees of physical effort. He drew on the earlier theories of physician Ernst Heinrich Weber (1795-1878) to develop what he then called Weber's law. This formula describes the functional relation between the measurable magnitude of a stimulus and that of a sensation one can only *infer*, due to an unavailability of the psyche to experimental testing.[5] Fechner established a tenet, later echoed in Wundt's work, that a scientist cannot measure individual sensation, but that

measuring a stimulus and the necessary levels that were required for a particular sensation to enter consciousness was possible. Fechner called these different threshold values *limen*, or the points at which sensations are actualized and known in consciousness by either acknowledgement or attention. Wundt echoed Leibniz in calling this phenomenon "apperception."[6] Fechner's indirect measurement of mental events through stimulus testing and threshold experiments formed a major pillar of Wundt's later structure of physiological psychology.

Another scientist who inspired Wundt was Hermann von Helmholtz (1821-1894), whose work had included major studies on optics and hearing that furthered Müller's notion of specific nerve energies that met in the brain.[7] In his classic study of hearing, the *Tonempfindungen* (1863), Helmholtz connected the human nervous system to telegraphy, the popular new technology of his moment that had captivated public attention.[8] In his "telegraph theory" of the nervous system, he stated that myriad nervous conductions had no particular differences, but that these fibrous canals in the body were like telegraph wires that passively transmitted electricity.[9] From this analogy, he argued that the real site of interest is the termination point of all these nerve paths in the brain. In the midst of these electrical analogies, Helmholtz also established the landmark theory that human physiology obeyed general laws of thermodynamics, especially the law of the conservation of work or energy.[10] Wundt, by connecting nerves to psychic formation with an entire regiment of experiments, would extend this tenet to psychic function, but the mechanical nature of Wundt's approach to the nervous system would ultimately be the most concerted attempt to plot the nature of the system's dynamism and mutability.

Wundt returned to Heidelberg in 1856, took his doctorate in medicine, and worked as an assistant professor of physiology for the next seventeen years, which included working intermittently with Helmholtz. During this time, he began to develop a theory of experimental psychology, in which physiological experiment could serve the interests of psychological investigation. Wundt stayed in Heidelberg until 1874. During the last two years of his stay, he published the landmark *Principles of Physiological Psychology*.[11] This text became the standard textbook for introductory courses in psychology and laboratories of experimental psychology, of which Wundt's was the first. Having opened in Leipzig in 1879, His lab revolutionized studies of the mind by offering a concerted program of study for young psychologists and soon, many flocked to his lab from all over Europe and the United States.

By 1890 Leipzig had become the center of physiological psychology. By this year, according to Edwin Boring, Wundt had succeeded in getting "experimental psychology permanently established in the world of science."[12] His theories and practices were prevalent across Europe, although that would change as the field continued to develop. In contrast to the elemental focus of Wundt's laboratory, many of his students began to work against their teacher's belief that higher psychic functions could not be tested through experiment, but only inferred. Wundt's response to these second-generation psychologists is addressed in chapter two. However, in order to understand the nature of his response to these later occurrences, an introduction to the content of the *Grundzüge der Physiologischen Psychologie* is necessary.

Basic Features of Wundt's Overall Theory

In the most general terms, Wundt had a psycho-physical point of view that accounted for both the mind and body of individuals within the social-historical world. He used physiology to study phenomena of sense perception as bodily processes that form part of this environment.[13] Earlier scientists like Müller, Fechner, and Helmholtz had established regimens of tests for understanding how a human's anatomy and physiology functioned both habitually and in reaction to change. Wundt absorbed this pre-existent availability of testing bodily energies and expanded drastically upon it, particularly in his scrutiny of the nervous system, which established these experiments as the bases for investigations of psychological processes. He sought to plot how "experimental modification of processes of life as practiced by physiology oftentimes effects a concomitant change, direct or indirect, in the processes of consciousness – which, as we have seen, form part of the vital processes at large."[14] Wundt's real breakthrough, as many historians of science have realized, was his application of a particular, pre-established system of experiment from the natural sciences (*Naturwissenschaft*) to the study of mind and consciousness (*Geisteswissenschaft*). [15] Wundt's laboratory practice in Leipzig altered categorically the social view of psychology. One had to be a physiologist in order to be a psychologist.

One also had to experiment. Based on its thousands of different tests, the fact that physiological psychology often goes by the name "experimental psychology" is fitting. Wundt needed a lab so that psychology could draw from "the fullness that modern physiology puts at its disposal for analysis of conscious processes," including effects of language and learning.[16] He believed that only experiment could uncover the full range of nervous function that formed the basis of psychic function. In this manner, his method

would create a balanced, synthetic field of physiology and psychology.[17] This belief had a philosophical consequence as well. Testing another's nervous reactions distinguished Wundt's theories from the legacy of inductive philosophy, which generally included a scientist drawing his theories from an observation of himself.[18] As Wundt saw it, the nervous system was slightly transformed or refocused in every act of self-observation. Observing changes in another gave one a particular window into the interconnection of body and mind, for an experimenter thus directed his thought processes solely toward observation, rather than simultaneously experiencing the phenomena of the test himself.[19]

But Wundt sought to do more with his method than critique the work of philosophers and scientists who used induction. His laboratory proposed a structure of mental formation that encompassed both inter- and intrasubjective phenomena—in short, it outlined a basic structure by which all people developed mental capacities through a bodily substrate of mental life (*körperlichen Grundlagen des Seelenlebens*). Wundt intended that his *Grundzüge* would provide the theoretical bases and practices of experimental inquiry to balance physiology and psychology in a structure of mutual support. He outlined this forceful dialectic in the early pages of this text. For example, he argued that, on the one hand, physiology erred when it used sensation both abstractly (as an idea) and as an element of an idea, or quality of a perceived object taken in through the senses. The term "sensation" in physiology was thus often being applied to both simple and complex contents, which created a great deal of elasticity for the term.[20] On the other hand, psychology erred when it described sensation as both the result of exterior stimuli and then as an idea, which connoted that it depended on internal conditions. Psychology also posited memory images as ideas, which confused entirely new nervous

excitation from current sources and guided reactions to current stimuli based on a subject's customary orientation, emotions, and memory.[21] Distinguishing between senses, feelings, and ideas set physiological psychology apart from other disciplines that relied on flawed notions of experience. Each discipline had a weakness the other could strengthen.

Based on the authority of this new epistemological dialectic, physiological experiment on willing subjects enabled Wundt to argue that the best model for any state of consciousness was flux that resulted from its various connections of experiential data to physiological processes in the nervous system.[22] But rather than poeticize this flux, Wundt made it far more elemental and largely unknowable. He used experiment to present a massive diversity of physiological phenomena as a seemingly infinite range of transitory conscious phenomena. Continual reconstitution of peripheral nervous fibers guaranteed that base aspects of the moving self—which form the base of the thinking self—were fleeting, which meant that a controlled experiment could only study the nature of dynamic processes, rather than reconfirm the function of a concrete structure.[23] In Wundt's view, the mind was continually changing, and continually open to change, rather than strictly determined by biology, pure ideas, or logic.[24] Shifting from belief in immanent mental awareness to observation of mental formation created a focus on bodily movement and gave the nervous system a new quality of volatility that Wundt then proceeded to study according to pre-existent methods of physiological experiment.[25]

Experiment quickly showed Wundt that nerves could balance habitual orientation and remain open to change. This dualism of structure fascinated him and provided a site for further experiment that yielded new complexities of mental formation. Based on this

attention to functional reciprocity between established structures and alteration, observing another's reactions caused *movement* to become the central phenomenon of study in Wundt's lab, in all its forms: conductive processes of nervous transmission, reaction time, eye movement, and thresholds of touch. Focusing on how movement both constitutes and changes psychological processes expanded Helmholtzian bodily thermodynamics into the territory of consciousness and made it the foundation of psychic processes, which immediately became more multi-faceted—neither nativist nor empirical, but inherently mutable. Instead of emphasizing a fixed and immanent sphere of consciousness, Wundt sought to show how movement characterizes a reaction to stimulus that may alter how experience is processed into consciousness. These views drastically altered how one conceived the relationship between mind and body.

Observing how many movements arose independently of volition led Wundt to locate the most elemental valid psychological events at a level of phenomenal sensation that was below a level of subjective awareness and at a scale that was generally beneath a person's capacities of observation. When experiments yielded different connections between movement and thought, this diversity reinforced his belief in degrees of consciousness, in which many forms of experience are neither attended to, nor fixed. Earlier psychologists, Fechner in particular, had established varying thresholds of awareness for sense intake and reaction, but Wundt's connection of these subliminal phenomena to the formation of consciousness was more focused, and made the establishment of thought rely less on prior intellectual performance and far more heavily on barely perceptible physiological processes of movement-based reaction. Testing the

body's ambulatory reactions to simple stimuli would allow one to indirectly understand the base levels of mental formation.

In focusing on rudimentary stimulus response, Wundt's lab discovered that mental change most often became manifest in forms of movement and reaction that appeared incongruent or outside habitual modes of sensory and cognitive orientation. Unexpected reaction altered structures of movement-based response, which had immediate (but not immediately knowable) connections to the formation of thought. Thus, new phenomena of physical life – especially movement – could change conscious processes, but in ways that are not automatically clear. The inherent mystery in this law of causality became an intensely poetic premise for avant-garde artistic production, but for the moment, I shall focus on how Wundt's lab practice shifted epistemologies of the mind and movement.

In the light of this newly realized combination of observable movement and opacity of mental function, Wundt recast the Cartesian mantra (*Je pense donc je suis*) into "I experience, therefore I can think." Thus, he reframed the mind and body as phenomenal formations of experience based on habitual arrangements of nerves that could change at any moment with the repeated absorption of discordant stimuli.[26] Studying the nature of these formations and reformations required that one investigate (1) which physical processes directly affected conscious processes, and (2) how conscious and unconscious processes facilitated or inhibited individual physical processes. Beginning a study of thought processes with inquiries of nervous conduction meant that Wundt and his team were in for long years of work.

Their data created a continuous upsurge of complexity for how the nervous system was an interface of mind and body, self and world. Studying mental formation by experimenting on the body illuminated physiological "modes of connection" between different nervous fibers that referred specifically to the relationships between conscious processes and substrates of the body that cause changes in thought.[27] In consequence of this focus, both consciousness *and* the senses – especially in relation to forms of movement – were to be important to the scientist. Testing bodily reaction illuminated the different ways in which nerves produced shifting levels of limits and facilitation. Basing selfhood on nerves generated an expansive area for studying mental development. Testing movement responses would uncover how the nervous and psychic enablers of ambulation formed. It is to these specific techniques of testing and the social dimensions of their application that we now turn.

The Culture of Experiment: Techniques and the Social Dimension of Wundt's Lab

Historians of psychology have closely examined Wundt's lab in terms of its philosophical assumptions, its material culture of instruments, and the social dimension of its practices. In its initially modest spaces in the storage closets of a lecture hall, Wundt and his students reconceived the mind from the ground up in terms of charting and measuring nerve reactions under the interpretive umbrella that these varying charges coursing through the tissues formed the basis of the psyche. Techniques of inquiry in the Leipzig laboratory have a social dimension that is utterly foreign to the notions of psychological analysis in which scholars of the humanities are better versed.

In this culture of experiment, the mind was knowable through collaborative studies of habitual and unconventional bodily stimulation. Wundt's project relied on observing and defining processes according to an activist model, in which a system could continually reshape itself in reaction to new experiences.[28] Base causality framed what was, in fact, an unpredictable dynamism of mind and body.

Given the breadth of experiments conducted over the decades when Wundt's lab was at its height, a historian can initially approach this mass of data by sorting the experiments into two broad categories: those of testing bodily movement with instruments, and those of cutting (*pathologisch*) into the body in order to examine its tissues. These categories differ in terms of enabling focus. Testing plots bodily energies through recording manipulation. Dissection introduces more drastic disruptions of tissue. Of course, one must keep in mind that Wundt and his students viewed these different investigations as elements of a single practice. I shall focus on the tests of bodily movement and will address pathology in a later chapter.[29]

Testing and measuring bodily reaction with instruments allowed scientists to study the relations between definite areas of the cortex and peripheral sensory organs. One could also focus on paths of conduction in the central organs of the brain.[30] Carrying out experiments on the conduction paths in the nervous system generally included enhancement or interruption of conduction. But the nervous system has a seemingly infinite variety of reactive zones and possible phenomena. Sole reliance on this method would produce an infinite variation. Consequently, this method was at best an aid for other experiments including microscopic histology of tissue and dissection.

Studying conduction altered tissues, but far less invasively than dissection. This technique generally involved sending electric currents through tissues, which caused a muscle to contract in reaction to this excess irritation or disruption. Wundt examined the nervous system initially by studying its molecular mechanics in conditions that were as simple as possible, which the scientist could arbitrarily alter and observe according to application of controlled variables. In this simple environment, one can better grasp the nature of a stimulus, which Wundt defined as "any outside affection of the nervous elements that serves in some way to arouse or modify their functions."[31] In such cases, nervous stimuli were either internal (from within the body) or external.[32] The external type could be manipulated by electric shocks or currents that "destroy the molecular equilibrium of the nerve elements, and create a peripheral contraction in the muscle fibers."[33] Functional derangement allowed for more immediate observation and calculation of nerve mechanics. One could also implicate the senses more fully and apply a stimulus, either electrical or sensory, and measure the time of a person's reaction to it.

A person taking reaction tests could, for example, press a button upon perceiving a flash of light. This process gave observers a sense of the mean time it took a stimulus to travel from the nervous tissues to the brain. In another test, a white circle on a black background or a black circle on white would appear arbitrarily to the subject, who would then have to press one of two buttons, depending on what had appeared. In each case, the focus of the experiment was to map the tissues in which a nerve impulse from the corporeal periphery traveled to the brain. The stimulus's appearance in consciousness and responsive act of will sent by the brain was only estimable after comparing the measurements of the stimulus traveling to the brain and the overall time of the subject's

responsive movement. These measured times were very short, often in milliseconds, which meant that the lab needed instruments for measuring these bodily thought processes.[34]

One of these instruments was the chronoscope (figure 1), which originally measured the speed of ballistics.[35] In 1840, the British scientist Charles Wheatstone constructed a two-step process to measure the infinitesimal interval between the firing of a gun and the striking of its target. He stretched a thin line across the mouth of a gun barrel that was connected to the device. Pulling the trigger broke the string and its connected electric circuit, which activated a separate switch that closed a circuit on an electric clock that moved its hands until the shell struck a target and broke the circuit, thus stopping the hands.[36] In this way, Wheatstone continued his contemporaneous experiments on the velocity of electricity and measurement that overlapped with his invention of the telegraph with William Cooke in 1839.[37]

In 1842, Swiss watchmaker Mathias Hipp refined Wheatstone's invention by regulating his clock with a spring that vibrated 500 times per second. The hands on this clock were not connected to the rest of the mechanism by any sort of machinery. At the start of the experiment, an electromagnetic coil activated the clock, but a small piece of metal prevented the movement of its hands. Interrupting this current, which marked the introduction of the stimulus, allowed the hands to move, and the subsequent registry of reaction by the subject on a small switch closed the circuit and stopped the hands.[38] But electromagnetism was not yet an exact science, especially when it came to the powering of instruments. The electromagnetic contracting and releasing of the clock ran on wet

chemical batteries that could display varying voltage levels, which would affect the registry of an interval.

Wundt's way around this problem was his employment of an outside instrument known as a control hammer (fig. 2) that could offer comparative regularity to the measured interval of the chronoscope in tests that he and his students performed separately from the subject. The control hammer helped calibrate the chronoscope.[39] This instrument consisted of a small weight at the end of a thin rod that was suspended with an electromagnet. Interrupting the current caused the hammer to drop past one contact point, which opened the circuit on the chronoscope, causing its hands to move. Then, it fell past another contact which closed the circuit, stopped the clock, and registered the interval on a chronoscope. If the determined interval of the control hammer matched the registered time on the chronoscope, then the instrument was accurate. Determining the interval of the control hammer required yet another instrument called a chronograph.

Wundt introduced the chronograph (fig. 3) as a way to register all of these intervals by graphic means in relation to a single mean measurement generated by the machine independently of the other instruments.[40] The chronograph looks a bit like a modern day seismograph and consisted of a paper cylinder that had been darkened with soot, which rotated ten times a second. As the cylinder rotated, a small device traveled on a track across the cylinder on a small arm that was perpendicular to it. This small device held a beard hair that was glued to a tuning fork, which gave off electromagnetic vibrations at a rate of 1,000 times per second. These little vibrations of the hair left a small, wavy line of negative registry on the darkened paper that registered time in milliseconds. This small line was a standard against which other intervals could be

compared. Within this little device were also three pins. These pieces were electrically connected to the chronoscope, so that starting the clock left a mark on the paper, and stopping it left another one. The third was open for the registry of another mode of response in case the experiment was more complex.

Thus, the three machines would act in concert to measure all kinds of reaction time and each other's function: the chronoscope measured the reaction, the control hammer regulated the chronoscope, and the chronograph maintained the interval of the control hammer and registered the reaction time from the chronograph, which created a comparative graphic trace of the time between an initial stimulus and the subject's reaction to it. As several scholars in the history of psychology have noted, reliance on instruments lent a technical overtones and regularity of measure to constructing an accepted normalcy of mental operation.[41] But this history of instruments omits the sheer mutability Wundt presented as the essence of the nervous system—a mutability that was (somewhat paradoxically) reinforced by instruments of infinitesimal measure. While these tests could plot reactions with mechanical exactitude, Wundt's own theories from the *Grundzüge* continually emphasize the problems and complications that arose within tissues that are under experimental scrutiny. These complications were not due to errors in instruments, but were the functional properties of nerves.

Given this use of instrumentation in the mapping and measuring of nervous phenomena, scholars have often accused Wundt of constructing a mechanistic representation of mental formation. Two major contributing factors helped its scientists avoid this trap. First, the scale and breadth of Leipzig's inquiry helped its scientists remain focused on describing processes of thought and nervous formation as processes

(*Vorgängen*) in the truest sense, rather than establishing an essentialist model of how the mind worked.[42] Wundt's elemental focus helped him avoid framing mental processes as being an issue of stimulus and response in a purely mechanical way. *Any* physiological modification by means of exterior stimuli can alter the functioning of one's consciousness. Lab tests helping to isolate and document these processes would include modifications or manipulations of certain aspects of daily activity in order to test reactions and modifications of conditioned response.

Second, studying how nerves changed also contributed to Leipzig's avoidance of physiological functionalism. One could test an extent process or observe how that process changed with the introduction of a new stimulus. In tests of extant processes, controlling the conditions of testing fostered the formulation of psychological effects into organically based categories of subject formation that, in turn, enabled further systematic analysis of causal relationships in more tests. In combination with studies of present processes, tests that involved altering the conditions of reactive movements or stimulus response in individuals, their natural environments, or the focus of attention used to sort out experience itself (again, by initiating bodily motion) created a representation of consciousness as a system of processes that continually and constructively changed in response to "functional derangements (*funktionelle Störungen*)" of its nervous substrate.[43] In the lab, Wundt and his students tested how mental processes formed and changed, which meant that functional derangement became a major condition of testing. Physiological psychology interpreted conscious processes "by their reference to physiological conditions (*Bedingungen*)," but the main intent of testing during this time was the belief that many of these conditions became noticeable only when nervous

physiology underwent outside modification.[44] Once a process had a certain degree of regularity, one probed its scope by varying the intensity and duration of applied stimuli. That mode of reference required constant monitoring and redefinition according to an innovation in the scientific paradigm of experiment that "enables us to arbitrarily vary (*willkürlich variierbar macht*) the conditions of our observations" in a way that allows one to grasp the diversity of mental phenomena that derive from experience.[45] Understanding initial levels of thought formation required focus on base nervous reaction, which had the highest mutability. Understanding a conductive process required modification of its normative balance of conductive energies. Arbitrarily modifying stimuli allowed scientists at Leipzig to track how changes to nerves affect the mind, but it replaced a unilateral model of continuity with an unpredictable self-generated complexity that was the property of the observed tissue itself.

In addition to the ramifications of these foci on processes, Wundt warned the reader of the *Grundzüge* that isolating one process would, by necessity, change how it interacted with other processes and with the psyche. In short, studying nerves caused these tissues to change in unpredictable ways. That factor led to two basic problems associated with stimulus testing. First, phenomena of concomitant irritation occurred when an applied current spread to areas of tissue that were not under direct scrutiny, but that nonetheless altered the nature of reaction. Nerves were like a string of firecrackers: setting off one triggered any others that were connected to it. Wundt thought that a multitude of tests could help experimenters distinguish elements of true reaction from concomitant irritation, but there were still discrepancies of cause. Second, given that one area of the bodily periphery had several different contact points of representation in the

cortex, it was difficult to tell whether, for example, a motor reaction was triggered by a cortical reception of a direct excitation in the muscle fibers (the desired site of testing) or a stimulus received from some other sense impression in the cortex that had nothing to do with application of the current.[46] Essentially, these two issues spotlighted the permeability of tissues and the openness of these nerve endings to change as an effect of new stimuli. Nervous receptivity could not be compartmentalized and any stimulus inevitably ran into other impulses in the centers that one could not predict. Experiment could only establish a sliver of psychophysical function, and trying to observe the very object of study only increased these complexities. Testing showed how truly volatile nerves were.

This volatility, however, had a testable extent. Wundt knew that any number of aberrant conditions could lead to varying test results.[47] Once repetition had established a mean coherence of determination, only then could other sets of experiments unfold that deliberately and systematically varied the nature of conditions and stimuli, complicating and expanding the data set in a manageable fashion, often by increasing the intensity of the applied stimulus. Arbitrary modification showed how the nervous bases of thought responded to the changing nature of experience. Thus, the testing was not a measurement of concrete processes; it was most often a study of how a dynamic system mutated in response to a changing flux of stimuli. Other forms of change were social and concerned the fluidity of roles in the social context of the Leipzig laboratory.

In comparison to criticism of omniscient analyses in institutional psychology, Leipzig's collaborative social dimension and the requirements of experiment among its practitioners have received little study.[48] Kurt Danziger has outlined how Wundt's

laboratory experiments "took the form of a collaborative activity in which the participants frequently exchanged experimenter and subject roles."[49] David K. Robinson has described how most experiments at Leipzig had three basic positions: the subject (*Reagent*) took the test, the experimenter (*Experimentator*) conducted it, and the observer (*Beobachter*) recorded the technical conditions of the test and its results (fig. 4).[50] This social dimension is inextricable from the nature of experimental practice, because this group had to follow Wundt's four basic requirements for experiment and how one participated in it.

These rules drew on physiological experiment and were thus familiar in the natural sciences of the day.[51] First, the observer (*Beobachter*) must know when the event under examination is to begin. Second, the observer must attend closely to the entirety of the experiment, which was no small task, given the tedious focus of the Leipzig tests. The next two requirements concerned the nature of testing. Wundt's third requirement dictated that it should be possible to repeat every observation several times under the same circumstances as a way to guarantee control and constancy in the test results. The fourth requirement held that arbitrary modification of attendant circumstances should determine the mean nature of conditions under which a reaction occurred. As outlined above, experimenters believed that multiple stimulus tests with different forms of arbitrary modification would expand knowledge of nerve function. But the social practice of experiment had other consequences beyond data management.

This particular social dimension of collaborative lab practice couched within it a major ontological belief in its seemingly innocuous practicality of cooperation. Danziger has argued that these collaborative experiments met the need to "provide evidence of

these universal intraindividual processes and their special forms of determination known as psychic causality," or higher forms of thought.[52] But one should remember here that evidence of a phenomenon's existence was not the phenomenon itself. To use a metaphor of computer hardware, they were testing circuits, not observing the function of the whole motherboard. Nervous impulses gave indication that psychic causality existed, but its nature was only ever open to inference in the laboratory context. Wundt's intent to establish shared experience on basic characteristics of nervous functionality within overlapping, culturally shared action patterns fostered this overt tonality of interchange and collaboration.[53] Leipzig scientists gathered data in a collective endeavor that represented mind and body as interactive pieces of the same functional instrument. They perceived these basic techniques of formation to be relatively uniform among members of a society.

Wundt always taught his students that elemental functions of charge and transmission were partially connected to higher functions, but cautioned that these operations were outside the boundaries of experimental inquiry. One could not hope to understand the mind solely by recourse to these rudimentary experiments: "Such a task holds out absolutely no hope of accomplishment, since the isolated stimulation or section of a conduction path in the interior of the brain presents insuperable obstacles."[54] Thus, while an experiment may have implicated psychic processes, the lab understood that these phenomena were not immediately measurable. Second-generation psychologists would think otherwise, but Wundt's limitation on experiment explains why, out of over a hundred articles in *Philosophische Studien* detailing the results of a great many more experiments, nearly half the projects were dedicated to tests on reflexes or reaction time,

while only about ten percent directly considered psychic phenomena.[55] Given this lion's share of testing, Wundt was able to build upon an already complex structure of sensory phenomena and carry it over to its possible affects on the formation of mental operation.

Reconceiving the Senses

Based on his mass of accumulated data, Wundt refined Helmholtz's establishment that the different senses were, in fact, simply different processes of nervous movement. Unlike Helmholtz, however, Wundt coupled this belief with studies of how mutable its structures could be. Nerves were not just passive conductors, but were more like ivy that grew and twisted in reference to new conditions.

All the senses also had a basic similarity concerning knowable qualities of operation. For Wundt, the senses mattered only in the specific means of transmitting data to the higher regions of the brain by means of different conduction paths. He considered these phenomena inseparable from movement, and thought that each sense has a distinct physiological mechanic of conductive style. Consequently, one had to study each sense in terms of its visual appearance and its mechanics of conduction.[56] For Wundt, all the different kinds of sense data gathered together in a big knot of tissue called the cortex, where it combined with various channels of motor nerves.

The cortex was the real undiscovered country at this point. Wundt acknowledges that "it is impossible, as things are, to put a physiological or psychological interpretation upon many of the structural features that have already been made out . . . The course of the paths is, however, too complicated, and their origin too uncertain, to admit of any but an ambiguous result."[57] In other words, functional characteristics of the higher regions

of the intellect and brain were shrouded in mystery. Wundt's descriptions of the higher region of the brain demonstrate his resistance to placing determinate interpretations on the brain structures other than characterizing basic functional processes and the mehanics of change. He remains rather general in his discussions of organs in the brain.[58] In his text, Wundt includes a cross section of the pons, which transmits charges from the cerebellum to the cerebrum, in order to illustrate how "extraordinarily complex" it is, and to emphasize how many conduction paths that were formerly or subsequently divergent meet in the pons (fig. 5). It is a bottleneck of nerve energy. For Wundt this small organ exemplifies "the composite character of the physical substrate of mental life" and emphasizes why one cannot simply assume that s/he can study higher mental functions directly in single experiments: the nature of the tissue and its housing of sense data is manifold to an extreme degree.[59]

Sense data was composite in two ways. First, different sense data from distant peripheries of the body merged in the cortex. Second, one of these peripheral areas or senses had many different connection points in the cortex. Sense data not only came together in nearly indiscernible ways, but came together in a multiplicity that one did not necessarily see on the periphery of the body.

According to Wundt, distinct centromotor (cortical motor nerves) and sensory conductions come together in the cortex and were differentiated only in terms of conductive paths. The essential characteristic of the cortex was its bringing together of elements that are spatially separate at the periphery, but that "cooperate for the unitary discharge of function."[60] Differences in the regions of the cortex, where all nerve energy travels, "are in every case merely relative differences in the number of particular

elements and in the development of the layers."[61] Any sense data presented to consciousness is concomitant, which happens when more than one sense sends charges to the cortex. All the impulses of movement and sense data are concomitant in the cortex, so all sense data converges in a single place. The notion of specific elementary nerve function was difficult to maintain, given the nature of the cortex. One nerve charge in the cortex always involved several other distinct charges of different varieties.

The term "manifold representation" (*mehrfachen Vertretung*) describes how one area of the body has several means of representation or connection in the cortex. Certain parts of the cerebral cortex are not necessarily areas of specific function or parts that are specific reflections of peripheral organs or reflective centers of a higher order. "Centers" in Wundtian physiology are reciprocal meeting places for connections between distant organs or physiological functions that facilitate higher interactive practices by connecting to one another in the cortex. Motor or sensory areas of the cortex differ only with respect to the cell forms. Like geological layers in a section of landscape, the stratification of nervous tissue is never uniform with respect to relative thickness of its layers or the content of those layers as it relates to the ratio of different types of nerve cells in a given content area. In sum, "not only are the essential morphological elements the same, for all divisions of the cortex, but their general arrangement also presents no really significant differences."[62] Wundt located the highest complexity on the outermost layer of the cortex itself, which has branch paths of nerves that form "a meeting place, in which conduction paths of the most various kinds come into contact with one another."[63] The cortex was a major functional center of reaction and basic thought processing, but the exact nature of its functions was impossible to delimit. Consequently, Wundt thought lab

tests should remain at this most basic of levels, because even at this level, issues of mind and body were already complex.

General qualities of sense as energized tissue far outweighed any particular quality that a sense displayed. Ruminating over particularities of sense data constituted philosophical projections for Wundt. The senses were styles of transmission; simple components of a larger nerve mechanics. Based on these findings, Wundt argued that studying individual sensations was pointless philosophy, because "mental elements are never given directly as contents of consciousness in the uncompounded state."[64] One is never aware of non-concomitant sense data.[65] In the abstract, therefore, one could conceive of simple sensations, but in practice, these would always appear in consciousness as a manifold of sensory data and subjective feeling. A conscious idea, then, was understood as manifold sensory data grasped as a meaningful whole. Any sense that one had of anything was already a large composite. Each sensation of this composite was an irreducible, objective element of mental life, but not directly correlated with anything in it, because one could not cherry pick particular sensations from the cognate of sense data that had already merged in the cortex. For Wundt, thought formed out of movement and became composed somewhere between tissues and ideas. Testing the nature of nervous conduction in its reference to conscious processes had to remain simple, because it was already very complex.

Wundt's establishment of conditions of conduction helped categorize this complexity by ruling out simplistic, specified analyses of nerve function and lent quantifiable elements to the qualities of this dynamic process. Complexity of the senses depended entirely on nervous conduction and these conditions were guidelines that

helped one understand why this system was so complex. The specific natures and characteristics of conduction paths were of crucial importance for Wundt in theorizing the relationships between physiology and psychology and made the careful exploration of the system's dynamics through experiment of utmost importance. He formulated analyses of these relationships according to four principles.

First, the principle of manifold representation dictated that every peripheral area on the body (eyes, or skin, for example) that falls under control of the brain and nervous system has several means of representation in the central cortical region.[66] Second, one finds ascending complication from the peripheral nerves to the cortex, meaning that the number of branch paths in the nerves increases rapidly from periphery to cortical center.[67] Third, conduction in the higher centers may travel in different directions. Centrifugal or centripetal conductive movement of nerve charges unfolds by the activity of the nerve cells. Every nerve cell has the potential for excitation and inhibition. These different directions of conduction are not universal to the entire nervous system and all of its cells, but develop a direction with respect to function. The fourth principle of conduction is central colligation (*zentralen Verknüpfung*). Often, sensory organs that lie far apart from each other nonetheless function in concert. This phenomenon of sensory cooperation is the result of merging within the cortex. For example, locomotion requires many different parts of the body, but in the cortex, these functions lie very close together.[68] Cortical conduction centralizes functional areas of the periphery by uniting them in the cortex.[69]

Due to this cortical activity, any supposedly separate function actually consists of many functions and had immediate connections to psychic phenomena. Absorbed stimuli would move toward the brain and into structures that had an immediate effect on the

psyche. Once in the cortex, sensations participated in a multiplicity of ideas, in which subjective emotions or other elements of consciousness that accompany these ideas were themselves always “complex” or manifold -- constructed, but never in a complete state that was transparent to knowledge. This relationship between sensations, ideas, emotions, and thought processes was the great mystery of physiological psychology, but Wundt knew he could not attack it directly. Instead, he purposefully focused on movement, which he understood as containing a psychic dimension.

If the simplest movements had plausible psychic consequence, then it was not immediately clear how much a movement reaction to an unexpected stimulus could affect the psyche, or, respectively, how much the psyche conditioned the performance of a reflex movement. Reflex is the simplest central function that approximates most clearly to a pure conduction of stimulating processes. Reflex phenomena are purposive, or—in Wundt’s sense—evidence of organic, nervous functionality. “Purpose” means the system works, but not that it gives evidence of motivational (psychic) intent. These basic reactive movements became the subject of an entire regimen of tests that plotted the multifaceted characteristics of this most basic movement form. In reflexes, Wundt believed the cortical substance modified its form of unidirectional conduction from sensory to motor paths.[70]

But given that the centrifugal trajectory of nerve energy in a reflex comes from the cortex, all movement had some kind of connection to the psyche. Possible presence of psychic processes in reflexes is an issue regardless of the known connection between movement and psychic phenomena, especially because the two related areas had such a dizzying range of complexity and manifestation. When he studied reflex, Wundt sought

to uncover whether it is a pure mechanical consequence of stimulation, or psychical actions that evince a certain amount of consciousness. Self-regulation of reflex processes indicates mechanical necessity. But consciousness of some sort also plays a role. Wundt writes that "there is no reason whatever why a sensory stimulus should not release a reflex movement and arouse a sensation or idea at one and the same time, so we cannot take the absence of all conscious process as the direct criterion of a reflex movement."[71] The seat of reflex response in the brain, no matter how simple the reflex, raises the issue of possible proximity to psychic functions. Reflexes may occur at the periphery, but impulses to movement begin in the brain.

Practice: Nervous Formation of Habits

A reflex response appeared to have a regularity that depended on whether one was accustomed to certain stimuli. One could build a threshold of expectation for it. For example, flinching at a loud noise is less likely to happen if one is at work on a firing range. Even then, this person would likely flinch if a similar noise occurs while s/he was at home. Basic reflexes were not just raw energy. Wundt and his team found that the nervous system had processes by which a certain regularity of function came under enforcement. But this regularity was more than just mechanics, because, as the above example illustrates, these regulatory systems were most often specific to certain spaces and one's general awareness. The nervous system was an interface between self and world, but all its paths met in the cortex, where it came into contact with psychic function. Thus the psyche's connection to space depended on a balance between how nerves became habituated or accustomed to certain practices and remained open to

change in a manner that allowed for a functional reshaping or reconditioning of the subject to new spaces and stimuli. These two polar ends of habituation were practice (*Übungsphänomene*) and pathmaking (*Bahnung*).

Thermodynamics guided the functional reciprocity of these two phenomena. The complexities of Wundt's subject of study required regulatory processes in the body and philosophies applied to it from outside that could aid one in comprehending the nature of its morphology. At the time, Wundt's lab practices appeared to repeatedly confirm Helmholtz's earlier breakthrough discovery that basic laws of thermodynamics governed the human body's processes. The fundamental model that Wundt taught his readers was that the model of conservation of work could be carried over to nervous processes and, ultimately, to the development of psychic processes.

But in contrast to Helmholtz's earlier model of nerves, Wundt had established that nerves were not merely passive conductors, but that these fibers were very malleable. Nerves were not, however, completely chaotic. A healthy nervous system is a functional mechanism that works to reduce nerve stimulation in accordance with laws of mechanics that concern the conservation of work and energy. Following the conventions of physics to explain such relations of stimulus and response, as many in his generation did, Wundt defined this energy in terms of mechanical work, or as "any operation that changes the position of ponderable masses in space."[72] Because mechanical work is so easily measured, it qualifies as perhaps the most convenient scientific metaphor used to model nerve functions experimentally. Instruments fostered the metaphor with infinitesimal precision. Even the movement and change of distance between molecules could be conceived of as another form of work. In either case, physics provides well-articulated

models for the work of position and motion remaining in constant and predictable equilibrium. This model, moreover, could be extended to internal molecular work, in which particles of mass were in constant motion, despite their appearance of rest. At the uppermost level of theorizing subject formation, even the equilibrium of the healthy nervous system could be construed as resembling these other physical properties that operate according to the law of the conservation of work.

External work by means of contraction or stimulation of nerves will give way to an opposing recovery of released energy. In this vision, neither body nor mind can ever been seen as fixed or at rest, but rather as continually at odds with itself, as nerve cells undergo "the constantly varying play of excitation [*Erregung*] and inhibition [*Hemmung*]."[73] For Wundt the secret to discerning mental faculties required that one began not from the highest possible realms of human consciousness, but from the most rudimentary forms of consciousness in the physical world. Conservation of work at the atomic scale encouraged analyses of infinitesimal occurrences in the human corpus. Process driven self-governance in systems happened far below the scale of human consciousness. Lab tests had confirmed the existence of a great deal of microscopic phenomena triggering mental alteration through movement. Consequently, Wundt argued that nerve cells and nerve tissues drew from the evolutionary logic of cell growth and evolution.

The self-generative causality and self-regulating capacities of the nervous system gave it a propensity to form habitual patterns of action and movement in the nervous substrate of the psyche that Wundt called "practice" (*Übungsphänomene*). Practice arises from repeated irritation that increases the excitability of the nervous system and the sense

organs to which it is attached.[74] Observing and arbitrarily modifying thresholds in the body required knowing how cycles of orientation were repeatedly impressed on the nervous system to form habitual modes of conduction to the brain. Of utmost necessity in this model was the body's contact with space through movement.[75]

Any practice has a base causality of formation. Once triggered, excitation by irritation in the nerves does not vanish immediately. Applied stimulus increases both excitation and inhibition. A momentary stimulus will not usually cause excitation, since inhibition is in too high a quantity. But repeated stimuli decrease negative molecular work in proportion to positive, so that repeated stimuli cause excitation. As a result of this factor, "if several stimuli are successively applied at such intervals that each falls within the period of the decline of stimulation set up by its predecessor, the irritability of the nerve is increased."[76] Wundt thus provided an image of the body/mind link as a seething tissue of contradiction seeking to keep itself from becoming derailed as it confronts waves of stimuli. Moreover, it was not clear in advance whether inhibition or excitation of the irritation would win out and become more prevalent, and what the body's capacity for change and resistance might actually be. One had to test its capacity.

Testing reactions allowed an experimenter to establish the functions of a practice in greater detail. In these habitual responses, "certain processes of excitation are facilitated: a result . . . can be produced most directly by an enhancement of excitability within the nerve paths" on which the nervous irritation runs its course and causes heightened excitation.[77] A major enabler of practice was the function of inhibition in the nervous system. In this function, the habitual paths of nervous conduction that practice had established could work together to inhibit the introduction of discordant charges that

unexpected stimuli introduced into the system. Inhibition might come from the higher centers and lessen the irritability of lower lying reflex centers.

In Wundt's view, nervous formation and resistance to instantaneous absorption of all nerve charges gives the body and mind its overall functionality. Practice and phenomena of inhibition aid in establishing a functional regularity of nervous conduction that formed the immediate basis of psychic operation. Testing the reactions of the body allowed one to realize how these regulatory phenomena arose. Wundt abstracts the causality of nervous practice from the effects that it produces in other tissues "which always make their appearance after a considerable interval" and constitute in their summation fundamental phenomena of practice.[78] Practice helped the body avoid fatigue. Its seat was the nervous system, "which is so constituted as to be very readily changed by stimulation: the change manifesting itself in a continuously increasing effectiveness of subsequent stimuli."[79]

Given their function as an interface, peripheral nerves most often displayed the phenomena of practice. These peripheries were on the front line of movement and were most closely knit to spatial conditions. This process recurred in the context with attending modifications of molecular processes that the nervous system underwent during transmission of stimuli. Practice has two main consequences. First, coordinated movements that were first difficult became easier. These movements that required continuous voluntary control now occurred involuntarily or automatically. Second, the malleability of the nerves compensated for rather than reconstituted the "functional disturbances" that reordered the relationship of nerves to the centers in the brain.[80]

Phenomena of practice became the physiological hardware that enabled the functional absorption and processing of experiential data.[81] Thus, the most basic movement reactions were already intensely complicated in ways that no single experiment could uncover. Despite this complexity, Wundt was still able to outline five basic steps of any movement reaction, which were the most rudimentary indicators of practice.[82] First, sensation was the movement of the nerve impulse from a sense organ to the brain by way of the nervous tissues. Second, perception marked the entry of a nervous signal into the field of consciousness. Third, the signal received focusing through apperception or attention. This focusing was entirely more difficult, if not impossible, if the stimulus was outside habit. Fourth, the brain released an appropriate response that became an act of will or volition. The fifth step was responsive movement, a purely physiological phenomenon which placed the body's absorptive and reactive tissues as the initiating and concluding steps on either side of three other processes that, according to Wundt, could only ever be estimated.[83]

Continuity and sequence in these movements arose as a quality of repetition. Ease and automatism of movements that were once voluntary and sometimes difficult demonstrated "increasing facilitation of the excitatory processes in consequence of their frequent repetition."[84] New techniques that required continual monitoring by volition became habitual or automatic if one repeated them enough times. Since this psychology presented consciousness as an array of alternatively malleable action sets—rather than an all-embracing motivational and narrativistic unconscious that irresistibly guides all actions or determines reactions—then consciousness must be construed in relation to the stimulus provided. This model of unconsciousness concerns a varying level of awareness

and hinges on whether volition or thought is needed to trigger action, or if it is automatic. But its broader area concerns whether a subject can sense change occurring, and if so, how much of it. The nature of that state of unaware being and doing will change if one manipulates conditions that caused the gesture or reaction to be unconscious in the first place. The role of volition in Wundt's process was be an application of psychic energy or attention to the realization of a task. Volition allowed one to actively manipulate attending cognitive structures.

Volition did not play an observable role in all movements, but within these movements, one often saw the effects of practice. For example, reflexes have neither psychic causation nor conscious intermediaries, but they are rather "related by their purposiveness to psychically conditioned movements."[85] With prior knowledge of Wundtian theory, one can read between the lines in this instance. Purposeful movement resembles psychically conditioned movement by the common place of habit. Reflexes and psychically conditioned movements each indicate the workings of nervous habit. One is simply more conditioned than the other—not in some imminent sense of will, but simply as the result of more repetition, like a trail in the forest. "Will" in the Wundtian scenario is a habitual combination of many different physiological processes, which make reflex and psychic conditioning two different but deeply related consequences of nervous mechanics, with psychic conditioning being the result of a structuring process that began with reflex.

For Wundt's model, the continuity of this process matters a great deal, because the existence of mental functions can never be inferred from the gross physiology or physical nature of organic movements.Instead, these functions can only be inferred from certain

special conditions that accompany or attend their performance—from the interplay of that physical nature with environmental stimulus, as in the example of the firing range. One can trace this interplay by plotting how the characteristics of any external stimulus impact the body: the stimulus will provoke a specific nerve reaction, and the repetition of these reactions will then contribute to the formation of habit and thus to the building blocks of consciousness. Stimulus affects habit and molds movement around it; consciousness lies at the boundary between the doing and the realization of the act. Thinking about this thought process will probably not correspond to that stimulus and the neurological response to it, simply because so much sense intake and movement occurs prior to any noticeable psychic activity. But this movement of the muscles yields "only an indirect measure of the processes of nervous excitation."[86] In short, accounts of gross anatomy will by no means grasp in its entirety what is going on in the neurological subsystems of the muscles. Any stimulus also functions as a psychical quality, so that when the body changes, mind changes, and the reciprocal, but when the body moves, it is not always clear why.[87]

Experiment could help one partially investigate how to plot the complexities of this issue, because the relationship that Wundt posits between triggering stimulus and observing reactions becomes stronger by guaranteeing a relative constancy of the substantive state of the muscle or tissue that forms the subject of experiment in the lab. To be sure, this is a mythical limit condition. Moving from contraction to nervous process requires conditional controls to facilitate comprehension of how the contractile substance relates to the nervous processes initiative. Thus, a narrowly defined

experimental condition, focused on specific nervous processes, can potentially produce the most observable results. A researcher simply had to do it thousands of times.

"Observation" in these terms needed to be qualified, for in any structure of habit or practice, which lent regularity to a system, it only appears that the nervous system is displaying regularity or rest. In fact, its molecular compounds are in continual motion: the image of rest is conditioned only by reference of the data to mechanical modeling.[88] This image is again a product of the analysis strategy used. If the mass of nerves in the system is in fact unstable, then the scientist posits it as existing at a higher level of work. That work is manifest externally when a compound passes from an unstable state to a stable one and thus releases energy or causes a movement. Ultimately, the stability of a physiological system resulting from interior molecular work must renew itself after losing energy in external molecular work by the retransformation of its atomic contents. Stimulation of a nerve changes this situation entirely. Often, the body will move in new ways that cause the nervous system to undergo change.

Pathmaking: Forging New Experience

In Wundt's theory, these changes to nervous tissue were known as "pathmaking" [*Bahnung*]. Nerve energy that is inhabitual (outside practice) in the nature of its stimuli will flood the system, unless nerves compensate for it and sort out ways to process these new excitatory impulses by developing new clusters of nerves and conductive paths for the recently introduced charge. Thus the conservation of energy, in which forms of energy never dissipated but changed form, also applied to arrangements of nerves, which were the essence of mental energy. As a conductive system within the body, the nervous

system reshaped itself in accordance with thermodynamics, but in this space, it had quite a bit of room to move. Changes in the cortex never replicated any previous arrangement, but shifted with every introduction of stimuli that are strong enough to break a path and alter the nature of experience and sensory distribution.[89] Compensation rather than reconstitution indicates that a stimulus has caused nerves to "strike out new paths" within the central nervous system.[90] In contrast to the facilitation of action by repetition that characterizes one form of practice, "under suitable conditions, the stimulation may strike out new paths within the central substance: we may accordingly designate this latter effect of practice, in contradistinction to direct practice by repetition of function, as pathmaking."[91] For Wundt, forging new pathways for conduction in the brain could initiate for process-based rehabituation of physical experience and its attending, gradual emergence of psychic consequences in the mental life.

Thermodynamics guided this basic dichotomy of repetition as facilitation and alteration in a framework of preservation. When an irritation runs through a nerve cell in a given direction, the cell becomes predisposed to direct other charges, in accordance with the conservation of work. In this instance, reconstitution of prior forms or complete resistance to an irritation would create too much nervous and physical stress for the organism. Consequently, the process works toward rearrangement. In these formations, the body shaped the mind far below the limen and scale of one's awareness.

Sense intake was often subliminal and at the cellular level, so the majority of the process would probably be unconscious, meaning that one would experience forms of reactive movement that looked and felt discordant, rather than being entirely aware of how and why pathmaking was occurring within one's nervous system. If the person

cannot help but change, then it is generally for self-preservation. Thermodynamics certainly lent functionality to the system, but at the level of nervous change, new movements triggered the alteration of conduction and substantiated the belief that "processes of conduction in the central substance at large cannot be confined within fixed limits; elements which, under normal circumstances, the excitations are annulled by concurrent inhibitions must be able, under the new conditions of practice introduced by the destruction of former conduction paths, to enter into new functional connections."[92] New paths can be forged. Habitual conductive paths may inhibit the transmission of discordant charges to the brain, but if these new charges are repeated, then the nervous system reshapes itself and develops new conduction paths that transmit new stimuli of energy.[93] Frequent repetition of stimuli enhances irritability, gradually reduces inhibiting forces in the nerve paths, and thus builds physiological and psychological techniques of experience by means of practice, which signals habit formation. Like a thresher through a garden maze, pathmaking might cut a swath right through that harmonious tissue.

One immediately grasps the functional reciprocity between these two forms of practice and their inherently cyclical and process-based nature. Repetition of a stimulus will always cause an alteration of nervous substance; whether that alteration is one of facilitation or pathmaking will rely on the charge and its comparative relation to previous nervous structure. If a stimulus does not immediately travel down a habitual path, then it sets forth irritations and excitations in the nervous system that carve new paths. This fresh path, like any path, continues to function only by means of repeated traversal. Pathmaking describes the mechanics of how one deliberately alters practice. The

malleability of the nervous system requires that certain paths rearrange at any given moment in order to process the charge, or to recompose and make new paths.

One can more fully appreciate this dynamic in two supporting phenomena known as “preferential conduction” and “transference.” Wundt posited a law of preferential conduction for analysis of how nerves transmit stimuli. This law is the foundation of habit. Irritations or disturbances to which one has become accustomed often travel down preferred lines of conduction. Pathmaking has taken place, and the repetitious response to stimuli has stabilized this specific, miniscule section of the nervous system. Irritations that excite the system and exceed the boundaries of preferential conduction often require the forging of secondary conductive paths by means of auxiliary courses and repetition.

Transference is a function by which the transmission of stimuli carries over into these auxiliary courses. This phenomenon facilitates pathmaking in the production of new experiential habits and depends on the morphological nature of nerves. Each nerve ending is dendritic; it looks like a little root system with a main conduction path and a group of subsidiary paths. When the primary path suffers excess irritation, the secondary paths act as conduits for the excess energy. The existence of these secondary paths supports belief in the phenomenon of transference, or the transfer of a nerve charge from one to another or several other conductive paths.[94] The law of conservation of work explains the necessity of principal paths of conduction, but also of secondary paths “for the conduction of unusually intensive excitations, or for the transferences required by simultaneous movements, sensations, and reflexes.”[95] Differentiation of conduction paths in the higher regions relies on different conditions that define the nature of these higher paths. It involves more than one conductive path and may become pervasive and

habitual if repetition causes successful transference of nerve energies to expression in movement. Transference is a key element in making a highly volitional activity gradually shed its associated exercising of will.

Once the conductive paths have been laid, repetition conditions the response of the body to the nerve charges at the atomic level, and eventually the subject manifests new movements, practices, and actions that appear natural and effortless. Consciousness undergoes a metamorphosis during this process, especially from the gradual decline of volition in the subject. Phenomena of transference arise especially from movements that involve the intake of simultaneous sensations. These forms of action indicate formations of determinate conduction paths that function only under specific conditions of combined irritation or increased excitation.[96]

From Path-Breaking to Cultural Education and Resistance

As a base phenomenology with neither essences nor *a priori* categories, this model of physiological psychology also has in it an implicit commitment to defining mind as implicated in the world, not in any way prior to it. The artists mentioned in the Introduction and those that will be studied in more depth below took from Wundt's theories the base causality of nervous and mental change, but not the overall *Geist* of normative authority that German science rapidly built in the second half of the nineteenth century.

Within this model of experimentation lies a project of education or transformation. The key trait of physiological psychology that transfers into an educational program lies in these techniques of deliberate, experimental alterations of

experience, for as Wundt had argued, "it is the essence of experiment that we can vary the conditions of an occurrence at will and, if we are aiming at exact results, in a quantitatively determinable way."[97] One studied the nature of absorption by shaping nerve mechanics deliberately, which had an immediate applicability to shaping collective movement and thought patterns in a society. These conventional ways of being—including language, politics, religious beliefs, different social structures, and all manners of artistic expression—had become, especially since the beginning of World War I, politically suspect. This mass of everyday life constituted the German definition of *Kultur*; it was far more than fine arts. Rejecting this model entirely was certainly an option. However, this theory also offered a powerful model to those who were interested in making themselves other than and apart from the normative umbrella that hovered over this discourse.

Wundt's theories supported the deduction that consciousness could thus be altered through the experimental introduction of inhabitual movements. In a scenario of deliberate and repeated application, or in the guise of total chaos, the base causality of this overall model of nervous change could bloom into myriad different forms of experience through the different bodily motions that artists introduced into the sphere of cultural production. The basic logic of pathmaking and transference, when carried over into a sphere of experimental culture, would set forth changes that shook the foundations of normalcy by its very formative means. In the case of the avant-garde, however, these formative means became diverted and reshaped into the platforms for new consciousness and experience. It was no mere escapism, but an immersion within and reshaping of the most dominant psychological theories of the day.

Before turning to artists' responses to Wundt, it is first necessary to consider his other main publication, the *Völkerpsychologie*, and its broad impact on fields including sociology, ethnography, philology, art history, and any other discipline that dealt with the mind as a socially tuned organism. Wundt's motivation for investigating physiology had initially been social and cultural. In particular, he sought to expel cloudy techniques of reflection from the epistemological foundations of psychology. In his view, psychology could not be an *a priori* discipline substituting for pure logic, nor could it be purely *a posteriori* in its inspiration.

For Wundt, the scope and authority of the laboratory had its limits. Throughout his long career, he was well aware that he was outlining strategies of mental function for a certain context that must have looked different in other times and places. No one lived in a lab, but one had to prove that premise in a rather contradictory fashion by starting in its hermetic spaces. Separating moments of experience allowed physiological psychology to be cultural as well as mechanistic or introspective. In this account, consciousness had at its core a physical structure that was the result of a specific context and the possible, habitual actions that one could perform in it. But Wundt recognized that these rudimentary movements and thought processes were also responsive to the specific cultures in which habitual techniques of everyday life were practiced. *Both* nature and culture in their ways constituted the specific format of how one's mind as a physiological substance had a functional, effective relation to the formation of consciousness. Base causality was law, but space altered the nature of its ascendancy.

The necessity of a relative cultural space to the formation of variant modes of selfhood formed the base of the *Völkerpsychologie*, which extended the question of

mental development to how *culture* affects the processing of experience. That text explores how the history of culture may be read as a history of collective response to varying conditions of nervous stimuli in space. The lab showed how the brain changes depending on altered stimuli or means of processing categories of these stimuli and means, but these two categories of phenomena were also open to cultural-historical and sociological factors, not just to laws of nature. The *Völkerpsychologie* explained what the lab could not.

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[1] Edwin Boring, *A History of Experimental Psychology* (1929), second edition (New York: Appleton Century Crofts, 1950), 317.

[2] For more on Müller, see Boring, op cit., 81-90 and 371-379; Arens, *Structures of Knowing*: *Psychologies of the Nineteenth Century* (Boston and Dordrecht: Kluwer Academic Publishers, 1989), 22; and Laura Otis, *Müller's Lab*, (Oxford and New York: Oxford University Press, 2007).

[3] Boring, Ibid, 82.

[4] Arens, *Structures of Knowing*, 107-115

[5] Boring, Ibid, 286-292; Arens, *Structures of Knowing*, 22.

[6] Boring, Ibid, 286-295; Crary, *Suspensions of Perception*, 26.

[7] Studies of Helmholtz are legion. One may begin with Leo Koenigsberger, *Hermann von Helmholtz* (1906), trans. Frances A. Welby, (New York: Dover, 1965); Arens, *Structures of Knowing*, 22-23; R.S. Turner, "Helmholtz, Sensory Physiology, and the Disciplinary Development of German Psychology," in Woodward and Ash, eds. *The Problematic Science: Psychology in Nineteenth Century Thought*, (New York: Praeger, 1980), 147-166; Rabinbach, *The Human Motor*, 52-61; *Hermann von Helmholtz and the Foundations of Nineteenth Century Science*, ed. David Cahan, (Berkeley: University of California Press, 1993); Crary, *Suspensions of Perception*, 215-218; Gregor Schiemann, *Hermann von Helmholtz's Mechanism, the Loss of Certainty: A Study on the Transition from Classical to Modern Philosophy of Nature*, trans. Cynthia Klohr, (Dordrecht: Springer, 2009)

[8] Full title is *Die Lehre von den Tonempfindungen als physiologische Grundlage für die Theorie der Musik* (On the Sensations of Tone as a Physiological Basis for the Theory of Music). On its influence in culture see Myles W. Jackson, *Harmonious Triads: Physicists, Musicians, and*

Instrument Makers in Nineteenth-Century Germany (Cambridge and London: MIT Press, 2006); Rabinbach, 56-64.

[9] Best outlined in Boring, Ibid, 95.

[10] In a nutshell, energy can be neither created nor destroyed, but only transformed. Fuller discussion may be found in Rabinbach, 52-56; Bowler and Morus, *Making Modern Science: A Historical Survey*, (Chicago: University of Chicago Press, 2005), 79-92.

[11] French translation by Elie Rouvier as *Éléments de psychologie physiologique*, 2 vols. (Paris, Alcan, 1886); reprinted as *Principes de psychologie physiologique*, introduction by Serge Nicolas, (Paris: l'Harmattan, 2005). According to Crary, by the 1880s, Wundt's ideas were being fully discussed in the French press. Crary, Suspensions, 294 . 26. An Italian version appeared in 1910: *Elementi di psicologia* (Piacenza: Societa Editrice Pontremolese, 1910); Russian translation appeared from 1900-1914; critical responses in these languages also exist, along with studies in Polish, Hungarian, Swedish, and Spanish.

[12] Boring, Ibid, 325.

[13] Wilhelm Wundt, *Grundzüge der physiologischen psychologie* trans. E.B. Titchener as *Principles of Physiological Psychology* vol. 1 (fifth edition), (London: Sonnenschein and New York: Macmillan, 1904), 1. Titchener never finished his full translation of Wundt's text, choosing instead to focus on composing his own manuals of experiment for use by his students at Cornell University. Throughout this dissertation I will draw on this English version and cross reference it with quotations from the latter sixth edition of Wundt's *Grundzüge* (1908), which is arguably the pinnacle and most retrospectively useful of his overall revisions to the text, and will sometimes draw on the French translation for further cross-reference.

[14] Wundt, *Principles*, trans. Titchener, 3. The sixth edition is more specific and argues that physiology can help psychology in the way that physics helped physiology: "*Da nun aber die experimentelle Beeinflussung der Lebensvorgange, deren sich die Physiologie bedient, vielfach unmittelbar oder mittelbar auch die Bewußtseinsvorgänge verandert, die ja zu diesen Lebensvorgängen gehören, so ist heir die Physiologie ebenso dazu berufen, der Psychologie als methodische Hilfsdisziplin zu dienen, wie ihr selbst die Physik als solche gedient hat*." Wundt, *Grundzüge der Physiologischen Psychologie*, sixth edition (Leipzig: Engelmann, 1908), 3. Hereafter referred to as *Grundzüge*, sixth edition.

[15] Given that, from the point of view of German thought since Kant, all mental phenomena were necessarily engaged with the data of experience. Wundt thus works in a paradigm that tries to synthesize recoverable physiological and cultural facts of experience with German idealism's

description of how mind works in comprehending the world. Kant, *Kritik der reinen Vernunft* (1781), trans. Paul Guyer and Allen Wood (Cambridge University Press, 1999). The best source on the overall relationship between German psychology and philosophy is Arens, *Structures of Knowing*.

[16] Wundt, *Principles*, 7.

[17] According to Wundt, this synthesis had to occur in a way that allowed the field to avoid being solely "a province of physiology; nor does it attempt, as has been mistakenly asserted, to derive and explain the phenomena of the psychical from those of physical life." Titchener trans., Ibid.

[18] In fact, Wundt took issue with a science of mind that was "based on simple self-observation or philosophical presuppositions." Wundt, Titchener trans., 2. Instead, he is more interested to engage how "practically everything that the physiologists tell us, by way of fact or hypothesis, concerning the processes in the organs of sense and in the brain, is based upon determinate mental symptoms: so that psychology has long been recognized, explicitly or implicitly, as an indispensable auxiliary of physiological investigation." Titchener trans., 4.

[19] I use the male pronoun here in recognition that Wundt only taught male students, which was the social convention of his time. For Wundt, induction constituted the most egregious methodological problem. The supposed experiments in inductive psychology seem to him considerably more naïve, as its practitioners believe they can create "external conditions that look towards the production of a determinate mental process at a given moment" (Wundt, Titchener trans., 5). In other words, psychologists who do not use physiology as a way to model the processes of consciousness in a state of continual flux know what they want to find before they begin examination. They are all experts at tautologies of method, which required a redefinition of the experimental method, as Wundt had done. Wundt was thinking of modes of induction like those practiced by Hume or Bayes. For an outline of basic tenets, see John Holland, Keith J. Holyoak, Richard E. Nisbett, and Paul R. Thagard, *Induction: Processes of Inference, Learning, and Discovery*, (Cambridge: MIT Press, 1989).

[20] In this sense, according to Wundt, physiology "abstracts products of analysis from the connections in which they occur," or isolates as subject an element that is a crucial piece of a unified process Titchener trans, Ibid.

[21] Ibid.

[22] This was not Bergsonist flux because it was not metaphysical, nor was it person oriented. The Wundtian model also stands in clear contrast to the inductive, purportedly experimental psychology that lacked this connection and cast the observer as "so far master of the general

situation, that the state of consciousness accompanying this process remains approximately unchanged." Ibid.

[23] "*Nun sind aber gerade die Bewußtseinsinhalte niemals konstante Objekte, sondern Vorgänge, fluchtige Ereignisse, die fortwährend in ihrem Wechsel einander ablösen*." Wundt, *Grundzüge*, sixth edition, 5.

[24] Danziger, *Constructing the Subject*, 34-36.

[25] Wundt rejected Kant's notion that thought processes were imanent, or somehow above the immediacy of experiential conditions. Wundt's physiological psychology is thus entirely different from this earlier inductive psychology in the nature of its experiment. Earlier scientists like Fechner had attempted exact measures of energies in mental processes (thus isolating one kind of physical correlate of mind), but Wundt's science is an attempt "to arrive at a causal analysis of mental processes." Wundt, Titchener trans., 7.

[26] Descartes, *Discourse on Method*, part IV (1637) in *Descartes: Philosophical Writings*, ed. and trans. Anscombe and Geach, (Englewood Cliffs: Prentice Hall, 1971), 31-37. A nice summary of Descartes's overall views may be found in Charles Taylor, *Sources of the Self: The Making of Modern Identity*, (Cambridge: Harvard University Press, 1989), 143-158).

[27] Wundt describes the overall discipline: "*Die physiologische Psychologie ist demnach in erster Linie Psychologie, und sie stellt sich, so gut wie jede andere Darstellungsweise dieser Wissenschaft, vor allem die Aufgabe, die Bewußtseinsvorgänge in ihrem eigenen Zusammenhang zu untersuchen*." *Grundzüge*, sixth edition (Leipzig, 1908), 2.

[28] In contrast, Janet, like Freud, worked more in a diagnostic/analytic mode focused on normative cultural and personal health or illness.

[29] Techniques of dissection were these other forms. First, anatomical investigations including micro- or macroscopic dissections facilitate a "more certain differentiation of nerve elements from the other elementary paths, and thus enable us to trace the interconnection of the nerve elements." Ibid, 153. *Wesentlich vervollkommnet wurde übrigens in neuerer Zeit die mikroskopische Zergliederung durch die Anwendung der Färbungsmethoden, die eine sicherere Sonderung der nervosen von anderen Elementarteilen und dadurch eine weitergehende Verfolgung des Zusammenhangs der ersten möglich machen*." *Grundzüge*, sixth edition, 199. Anatomical examinations in combination with stimulus tests enable exacting and complex test results. Second, pathological observation may combine the first two methods of examination in its dual concerns with nerve disturbances and disruptions in anatomy. For example, arresting function in a predetermined area allows one to examine

the pathological changes in the nerve structures that are "functionally related" with respect to the damaged area. Principles, Titchener trans., 154. "…*oder es wird in früher Lebenszeit ein peripheres Organ, wie das Auge, das Ohr, zerstört und der Einfluß beobachtet, den dieser Ausfall bestimmter Funktionen auf die Entwicklung der Zentralorgane ausübt*." *Grundzüge*, sixth edition, 200.

[30] Ibid, 152.

[31] Ibid, 58.

[32] Mechanically, internal stimuli correspond to changes in the blood and fluids of the tissues; these are, however, considerably more difficult to measure.

[33] Ibid, 58-59. That is, where Freud's work on dreams relies on reinvoking internal stimuli in order to trace what individuals have become in reponse to the environment, Wundt stresses the opposite. Reactions like contractions or other neuro-muscular ones only furnish "a certain measure of the processes operative" in the muscle.[33] Freud's exacting, mentalist account is for Wundt impossible, because nerves function at the molecular level -- the account of mental processes implicates the physical, as well; not just as a knot of neuroses but as a pulsating mass of material nerve energies indexed by movement systems. It is hard to embrace the Freudian unconscious as a catholic truth in a context where amoeba had consciousness, too.

[34] For more on the history and philosophy of instruments in the laboratory of Wundt, see Sokal, Davis, and Merzbach, "Laboratory Instruments in the History of Psychology," *Journal of the History of the Behavioral Sciences*, 12 (1976): 59-64; Benschop and Draaisma, In Pursuit of Precision: The Calibration of Minds and Machines in Late Nineteenth-Century Psychology," *Annals of Science* 57 (2000): 1-25; Carroy and Schmidgen, "Reaktionsversuche in Leipzig, Paris, und Würzburg: Die deutsche-französische Geschichte eines psychologischen Experiments, 1890-1910," *Medizin Historisches Journal* 3 (2004): 27-55; Draaisma and de Rijcke, "The Graphic Strategy: The Uses and Functions of Illustrations in Wundt's Grundzüge," *History of the Human Sciences* 14 (2001): 1-24. For an outline of instruments used in different studies of attention, see Crary, *Suspensions of Perception*, 302-316. For more on the general epistemological consequences of instrumentation, see Galison, *Image and Logic: A Material Culture of Microphysics*, (Chicago: University of Chicago Press, 1997). Galison treats a different science and period from my own chosen focus, but his initial framing of how instrumentation functions in and between separate branches of science is essential for comprehending how instruments played a major role in the foundations of authority in Wundt's Leipzig lab.

[35] For the next few paragraphs I shall rely heavily on the excellent outline of Wundt's use of instruments by Benschop and Draaisma, op. cit., 3-10.

[36] Ibid, 5.

[37] For more on the history of telegraphy see K.G. Beauchamp, *A History of Telegraphy: Its History and Technology*, (Stevenage: Institution of Engineering and Technology, 2001).

[38] Benschop and Draaisma, op. cit., 7.

[39] Ibid, 7-8.

[40] Ibid, 8-9.

[41] For more on the history and philosophy of instruments in the laboratory of Wundt, see Sokal, Davis, and Merzbach, "Laboratory Instruments in the History of Psychology," *Journal of the History of the Behavioral Sciences*, 12 (1976): 59-64; Benschop and Draaisma, In Pursuit of Precision: The Calibration of Minds and Machines in Late Nineteenth-Century Psychology," *Annals of Science* 57 (2000): 1-25; Carroy and Schmidgen, "Reaktionsversuche in Leipzig, Paris, und Würzburg: Die deutsche-französische Geschichte eines psychologischen Experiments, 1890-1910," *Medizin Historisches Journal* 3 (2004): 27-55; Draaisma and de Rijcke, "The Graphic Strategy: The Uses and Functions of Illustrations in Wundt's Grundzüge," *History of the Human Sciences* 14 (2001): 1-24. For an outline of instruments used in different studies of attention, see Crary, *Suspensions of Perception*, 302-316. For more on the general epistemological consequences of instrumentation, see Galison, *Image and Logic: A Material Culture of Microphysics*, (Chicago: University of Chicago Press, 1997). Galison treats a different science and period from my own chosen focus, but his initial framing of how instrumentation functions in and between separate branches of science is essential for comprehending how instruments played a major role in the foundations of authority in Wundt's Leipzig lab.

[42] In terms of his method, Wundt distanced himself from earlier positivist or materialist theories of psycho-physics in his belief that data could not intuitively generate an intellectually sound theory. Instead of starting with data, one first conceived a theory, which in turn determined the nature of experiments that one subsequently performed.

[43] Wundt, *Principles*, Titchener trans., 100. I will have more to say about this notion below.

[44] Wundt, Ibid, 8-9.

[45] Ibid, 5.

[46] Wundt himself was very open about the problematic nature of elemental experiment: "Even in the most favorable instances, when the stimulation or transection has been entirely successful, we have established but one definite point upon a path of conduction; to ascertain its full extent, we

should have to make a large number of similar experiments, from the terminal station in the brain to the point of issue of the appropriate nerves." Wundt, *Principles*, Titchener trans., 152.

[47] These outside conditionalities often became the subject of their own tests, as in, for example, the early work of Emil Kraepelin on the influence of drugs and alcohol on the various faculties. Kraepelin conducted this research while still in Leipzig, before working on his better known studies of mental pathology.

[48] As a result of the attraction among academics for studies of the politics of pathology, Leipzig has been largely ignored by other methodologies like trauma studies and feminism as well. See for example Foucault, *Histoire de la folie à l'age classique* (1966), ed. Jean Khalfa, trans. Khalfa and Jonathan Murphy as *History of Madness*, (London and New York: Routledge, 2006); *In Dora's Case: Freud, Hysteria, Feminism*, ed. Charles Bernheimer and Claire Kahane, (New York: Columbia University Press, 1985); Elaine Scarry, *The Body in Pain: The Making and Unmaking of the World*, (New York: Oxford University Press, 1987); Jan Goldstein, *Console and Classify: The French Psychiatric Profession in the Nineteenth Century* (Cambridge and New York: Cambridge University Press, 1990); Janet Beizer, *Ventriloquized Bodies: Narratives of Hysteria in Nineteenth Century France* (Ithaca: Cornell University Press, 1994); Juliet Mitchell, *Mad Men and Medusas: Reclaiming Hysteria* (New York: Basic Books, 2000); *Traumatic Pasts: History, Psychiatry, and Trauma in the Modern Age, 1870-1930* (Cambridge and New York: Cambridge University Press, 2001); Mark Micale, *Hysterical Men: The Hidden History of Male Nervous Illness* (Cambridge: Harvard University Press, 2008).

[49] Danziger, "Social Context and Investigative Practice in Early Twentieth Century Psychology," in *Psychology in Twentieth Century Thought and Society*, ed. Mitchell Ash and William Woodward, (Cambridge, London, New York: Cambridge University Press, 1987), 15. Also by the same author "Wundt's Psychological Experiment in the Light of His Philosophy of Science," *Psychological Research* 42 (1980): 109-122.

[50] David K. Robinson, "Wilhelm Wundt and the Establishment of Experimental Psychology, 1875-1914: the Context of a New Field of Scientific Research," (Berkeley, PhD Dissertation, 1987), 101-102, 111. Danziger has shown how these roles and titles were anything but systematic: "When one examines the published experimental reports from Wundt's laboratory one finds that the social role system of the psychological experiment is so little developed that there is not even a general term that expresses the generalized role of the 'experimental subject.' The person acting in that role is usually referred to by his specific activity in a particular experimental context. He is 'der Reagierende,' 'der Beobachter,' 'der Vergleicher,' 'der

Associrende,' etc. The term 'Versuchsperson' (experimental subject) occurs too, but not in any systematic and predictable way as it would in a modern report." Danziger, "Wundt as Methodologist," in G. Eckardt and L. Sprung (Eds.), *Advances in Historiography of Psychology*. Berlin: Deutscher Verlag der Wissenschaften, 1983), 38-39.

[51] Woodward, "Wundt's Program for the New Psychology: Vicissitudes of Experiment, Theory, and System," in Woodward and Ash, eds., *The Problematic Science: Psychology in Nineteenth Century Thought,* (New York: Praeger, 1980), 167-197. Danziger *Constructing the Subject*, 34-35. Particularly because when someone diverged from Wundt's outline of the social dimension of experiment, this move away was in direct opposition to Wundt's structure of testing, as when, for example, act psychologists interviewed subjects, but were never interviewed themselves, or when Ebbinghaus performed his memory tests on himself and no one else. See also Greenwood, *The Disappearance of the Social from American Social Psychology*, 54.

[52] Ibid.

[53] Danziger argues that this social dimension plays a major role in the continuous, but contextually variant "relationship between the form taken by psychological knowledge and the structure of the relationship between those who function as investigators and those who function as the source of data." Danziger, op cit, 16. Danziger treats these issues in more general and broad terms in "The Social Origins of Modern Psychology," in *Psychology in Social Context*, ed. Allan R. Buss, (New York: Irvington, 1979), 27-46. This notion of the social conditions framing the production of knowledge forms part of Foucault's focus in his earlier work, but Danziger's findings differ entirely from Foucault's selected objects of focus, because the nature of their production was communal rather than singular and authoritarian.

[54] Titchener trans, 152. Wundt refers specifically to the shortcomings of enhancement and interruption methods in the sixth edition: "*Nur für zwei Fragen sind daher diese Methoden mit einigem Erfolg angewandt worden: für die Frage nach dem Verlauf der Leitungsbahnen in dem einfachsten der Zentralorgane, im Rückenmark, sowie in den nachsten Fortsetzungen der Rückenmarksstrange, den Hirnschenkeln; und für die Frage nach der Zuordnung bestimmter Gebiete der Hirnrinde zu bestimmten peripheren Organen des Körpers*." *Grundzüge*, sixth edition, 198. According to Wundt, experiment could "determine the course of conduction in the simplest of the central organs, the myel, and in the direct continuations of the myelic columns, the crura." Titchener trans., Ibid. "Myel" is an old term for the spine, and "crura" are bundles of nerve fibers, generally in the cerebellum.

[55] Cited in Robinson, PhD diss, 94. This tedious, exhaustive focus on sensory absorption of a stimulus and its appearance in consciousness was a philosophy of experiment and perspective on the mind that was, of course, open to furious debate that, like any other academic debate, drew on methodological differences, careerist alliances, and volatile, fragile egos.

[56] Given the continuing interest in critical studies of perception in the humanities, I shall here outline in more depth what brevity prevents in the body of my text; namely, Wundt's understanding of how vision worked. Wundt's descriptions painstakingly plot the senses as different manners of conduction. Base level nerves of hearing resemble cutaneous nerves, especially in the cochlea. Within the cochlea, peripheral connections to the vestibular nerve provides one's sense of balance, and a reflex path connects acoustic centers to muscular nerves, centers for articulation of the body, and movements of the eyes, all of which play a key role in one's orientation in space (Titchener trans., 185). The cochlea is the easily recognizable spiral shaped cavity in the inner ear where nerves for hearing are stored. This key trait of the bodily substrate of mental life results from connections between acoustic and vestibular nerves.

In the sense of taste, conducting fibers leave the central organ, pass near the center through bipolar cells, which are specialized sensory nerve cells like those in the spine, then branch into dendrites at the periphery of the tongue, which has two separate nerve trunks that process information from different areas on the organ. Olfactory nerves are closest to cortical areas of the cerebrum, so the paths of these nerves and their space to transmit information are shorter. The olfactory nerve is never a singular branch nerve; instead, it emerges immediately from the cortex as "numerous delicate threads" that issue from the olfactory bulb within the cortex. Thus the olfactory organ (the nose) is actually a peripheral element of the cerebral cortex, and this proximity to the cortex causes olfactory nerve fibers to resemble central fibers.

Optic qualities are part of a larger overall project of revamped gestures that alter consciousness. The central nervous system has displaced the "optic surface" to the periphery of the body. It is still a portion of the central organ (Ibid). Consequently, optic nerves that emerge from the retina are like olfactory nerves in the sense that both nerves resemble central nerve fibers. Rods and cones are nervous elements or "sensory epithelia" whose role in the conductive process results solely from contact with terminal fibers of the nerve tissue. In this trait of conductive process, rods and cones resemble gustatory cells. Layers of the retina cover the terminal fibers of the nerve tissue with layers of cells that are points of departure for the centripetal path of optic conduction to the brain. Distribution of optic fibers in the chiasma facilitates binocular vision. Chiasma is the crossing of optic nerves at the base of the brain.

Conduction of optic paths in either half of the brain consists of paths from the opposite retina. Standard accounts of vision present the sense as unidirectional: the fibers of the optic nerve conduct centripetally: nerve impulses are carried from the retina to the brain. Wundt found the process more complex.

In his model, three broad areas of conduction occur in the optic nerve. First, activities in the principle sensory path allow raw sensation to travel along the principal sensory path. Ganglion cells (retinal nerve cells) transmit excitation from the retina to the cortex by means of the "pregeniculum," or a small node on the optic thalamus. The thalamus is a mass of gray matter in the posterior part of the forebrain that relays sensory impulses to the cerebral cortex. Second, the centripetal mesencephalic path carries charges to the pregemina, or mesencephalon (also known as the mid-brain). The charge then travels from the mesencephalon by centrifugal paths to oculomotor nerves. This second conduction forms the process of visual reflex. One can see how these two uses of conductive paths relate when one catches sight of an object, and moves one's eyes to look at it closer. These two processes concern the intake of stimulus. The third manner of conduction is entirely centrifugal, and has two modes. First, main branch centrifuge sends charges from the optic cortex to the mesencephalon. Second, peripheral centrifuge carries nerve irritation from the mesencephalon to the retina.

[57] Titchener, trans., 168. Full quotation in the sixth edition: "*Für das Studium speziell der im Hinter- und Mittelherngebiet in Betracht kommenden Leitungsverhaltnisse kann nun aber zugleich die fur die allgemeine Orientierung der Leitungsbahnen im Rückenmark wertvolle physiologische Methode der Sonderung der Bahnen mittels der Trennung einzelner Faserzüge kaum mehr in Betracht kommen, da die in dieser Richtung namentlich in der älteren Physiologie ausgeführten Versuche wegen des verwickelten Verlaufs und des unsichern Urpsprungs der Bahnen ein unzweideutiges Ergebnis ummöglich liefern können. Vielmehr lassen sich auf solchem Wege höchstens einige Ahnhaltspunkte für die Beurteilung der Gesamtfunktion der Organe oder einzelner Teile derselben gewinnen*." *Grundzüge*, sixth edition, 214.

[58] For example, when Wundt describes conduction paths in the cerebellum, he writes that the concurrence of these paths is "extremely complicated" (Titchener trans., 173). The cerebellum is a large lobe of the hind brain in front and above the medulla. He invites his reader to "consider these paths as branch conduction, interposed in the course of the direct conduction from myel to cerebrum as mediated by oblongata and pons" (Ibid.). The medulla oblongata is the hindmost part of the brain that controls breathing and circulation. The pons are a band of nerve fibers that link the medulla oblongata and the cerebellum with the upper portions of the brain. The cerebellum

connects fibers of different function, especially sensory and motor. The cerebellum has a large number of cells of Purkinje, which are "elementary centers of connection between different fiber elements" (Ibid, 175). Cells of Purkinje were certain pear-shaped nerve cells in the cerebellum. The dendrites or branch areas of these cells mediate centripetal charge, and the neuritis or axons (which conduct impulses away from the body of the nerve cell at the base of the dendritic arbor) manage centrifugal functions.

[59] Ibid, 178. The sixth edition of the *Grundzüge* is more emphatic: "*Handelte es sich darum, einen Gehirnteil zu finden, der durch die in einen kleinen Raum zusammengefaßte Komplikation seines Baues die zusammengesetzte Ntur der physischen Substrate des Seelenlebens und damit die Absurdität jener Bemühungen um die Auffindung eines einfachen Seelensitzes veranscaulichen sollte, so wurde sich darum wohl kaum eine günstigere Wahl treffen lassen*." *Grundzüge* sixth edition, 225.

[60] Titchener trans., 218. For example, the visual center is not a simple repetition of the retinal surface within the cortex. Wundt described the retina as a forward projection of the cortical region. The visual center in the cortex, by contrast, contains connections to other conduction paths of a motor nature. By these connections, the cortex "is able to connect retinal excitations with further functional areas" (Ibid.).

[61] Ibid., 224.

[62] Ibid, 223.

[63] Ibid, 224. Several layers of the cortex in different areas possess relative degrees of development. These differences depend on the morphologies of three different nerve cells: pyramidal or centromotor cells that facilitate centrifugal conduction; stellate or sensory cells that are terminal stations of centripetal function; and cells of vertical longitudinal form in the substrates or deeper structures of association paths.

[64] Ibid., 13.

[65] In this view, Wundt was drawing on earlier theories of unconscious inference offered by Helmholtz, in which sense data is combined in the brain prior to the subject's becoming aware of the combination, but the nature of this new theory has become more directly attached to the mechanics of the nervous system that are manifested in different kinds of movement.

[66] Ibid., 228. The complex nature of manifold representation indicates that not all central representations cooperate in every discharge that results from sending nerve energy to the peripheral elements of the body. A peripheral area may represent itself in several different

fashions, but these various means of central representation do not require simultaneous functioning in order for successful central representation.

[67] Ibid., 226. In the original German, ascending complication is *aufsteigenden Komplikation der Leitungswege*. *Grundzüge*, sixth edition, 276. Every cortical area is in itself knit with manifold representation. The cortex constitutes new representations only in proportion to the possible necessity of more complicated coordination of functional units of nervous energy.

[68] Auditory sensations that become conscious ideas and bodily movements unfold in unison because of the large number of connections between the acoustic and motor centers in the cortex.

[69] Thus, an act of vision is not a centralized act as a mere sense of vision, but involves several motor functions and many other "partial functions concerned in the visual function" (Titchener trans., 229). The centralized form of a sensory idea indicates that one never deals with one sense like vision in total isolation. The nature of manifold representation and colligation in the cortex guarantees that any sense is already a manifold cluster of sensory ideas when it enters consciousness. For example, vision or auditory ideas always involve motor ideas. The representation of these different peripheral functions assures that any awareness of one function as supposedly distinct is in actuality already a manifold representation or the effect of manifold representation in the cortex. Vision is not a chain of images of separate points in the visual field that are projected upon the brain.

Congruities of sensory and motor functions are key functional phenomena in the "decussation" or separation and rearrangement of paths carrying visual stimuli to opposite halves of the brain that enable the visual organs to assist in yielding spatial projection. The even divide between the eyes (median symmetry) allows for symmetrical convergence if motor release in response to light stimuli is symmetrical on the median plane of the visual cortical center. This even synergy of decussation also appears in other sensory and motor functions, but is most clearly grasped in studies of perception. The image in the visual center of the cortex corresponds to spatial properties of the object. Binocular compensation for the asymmetry of the inverted image in the optic chiasm combines with compensation for vertical dimension in each separate eye. Decussation of the optic nerve shows the most obvious relations between decussation in general of nerve fibers with respect to manifold functional representation. With this crossing, the visual image in the cortex corresponds to spatial properties of the object by the decussational properties of the chiasm that compensate for the asymmetrical image. One estimates the spatial relations of objects by the position and movement of fixation before this point of rotation rather than behind it. Displacement of this rotational point in the interior of the eye directly compensates the

inversion of the image. The retinal image has little to do with this operation. As Wundt framed it, the hypothetical "image" in the visual center is more likely a system of excitations that corresponds to sensory, motor, and associative functions that simultaneously merge. Given this fact, his hypothetical structure of non-imagistic psychic causality is a superstructural, epiphenomenal projection of myriad nerve charges that exude from teeming centers.

Visual organs from lower life forms like those of insects offer evidence of manifold representation in more rudimentary form. The visual organs of insects are structured like tactile organs. The retinal image is a "rough mosaic whose spatial arrangement – since every facet represents a relatively independent dioptrical structure – corresponds to that of the external object; what is above and below, right and left, in the object has precisely the same position in its image" (Ibid, 230). The manifold representation of the human eye is the result of evolutionary changes in the organ itself, in which movement is a necessary and indivisible component of the visual organ itself, but the insect eye "is seated upon a movable stalk" that turns around a pivot point that lies behind the visual organ, and makes the peripheral means of insect vision more "like a tactual [tactile] organ" (Ibid.). In the insect world, vision is like touch. Vision also "looks like" touch. The two senses have an equally strong connection of manifold representation in the cortex, but contain different physiological mechanics that allows for a closer association of two distinct peripheral senses. The facets of an insect eye are compartmentalized but nonetheless close enough to each other that the visual sense possesses a functional structure that is more akin to touch. Seeing is touching. When physiological structures of vision are more like touch, the paths of optic conduction do not have any readily identifiable decussation like one finds in the optic chiasm of the human subject as it transmits data to the higher regions of the cortex.

[70] Ibid, 241.

[71] Ibid, 251.

[72] Ibid, 60.

[73] Titchener trans., 70. "*Der ganze Verlauf der Reizung ist dann von den in jedem Zeitmomente wechselnden Wirkungen der Erregung und Hemmung abhängig.*" *Grundzüge*, sixth edition, 105.

[74] Titchener trans., 70.

[75] I should like to stress here again that a body in space in the Wundtian sense, at least in my focus, is not a phenomenological body, but a twitching sponge of raw nerve charges and possible new paths to be made.

[76] Ibid, 75-76. Increased excitability that arises from rapid, repeated stimuli is the sole office of the nervous system. Wundt does not think it has anything to do with muscle tissue, but that

greater excitation and irritation by repeated stimuli – although its effects change in the muscles – is due entirely to activities and processes in the nervous system. Even if the muscle is paralyzed from fatigue, the nerves still become excited upon repeated stimulation.

[77] Ibid.

[78] Ibid, 76-77.

[79] Ibid, 78.

[80] Ibid, 100.

[81] But unlike act psychology or behaviorism, Wundt's work shows a focus on how the constituting elements of these higher functions require extensive study in order to establish how they actually work.

[82] Adapted from Robinson, PhD diss, 100.

[83] In the context, the development of this five-step program had reciprocal development, complication, and increasing openness to debate in correlation with the buildup of experimentation at Leipzig. Roughly half the experiments were focused studies of sensation and perception (the first two steps).David Robinson, "Wilhelm Wundt and the Establishment of Experimental Psychology, 1875-1914: The Context of a New Field of Scientific Research," PhD diss., University of California, Berkeley, 1987), 94. Danziger has also confirmed these findings: "A detailed examination of the experimental reports published in the twenty volumes of the *Philosophische Studien* shows that in the great majority of the reported studies the essential data base consists of objective measurements, mainly time measurements and simple quantitative judgments of features of experimentally presented physical stimuli." "Wundt as Methodologist," in Eckardt and Sprung, eds., *Advances in Historiography of Psychology*, (Berlin, Deutscher Verlag der Wissenschaften, 1983), 36. This majority of practice reflected Wundt's beliefs concerning the specific elements of mental function that were open to testing. He understood sensations as purely physiological phenomena, while perception, apperception, and acts of will were psychophysical combinations of physiological and psychic phenomena.

[84] Titchener trans., 100.

[85] Ibid.

[86] Adding to this difficulty was the fact that every muscle has its own intrinsic irritability that functions both as part of the organism and independently. Thus when a muscle reacts in a certain way, it is not necessarily clear what stimulus dominated to cause that movement.

[87] Ibid.

[88] The nervous system, in fact, appears stationary "simply for the reason that, on the average, there are as many processes of the one kind going on as of the other" -- it is in stable state, not a constant balance. A nerve substance that is supposedly at rest is actually "a stationary condition of motion," in which work produced by atoms cancel each other and prevents release of external work. These miniature battles within the molecule by its atoms constitute the potential work of a stable compound, no matter that nerve cells do not recombine as they process stimuli. Ibid, 66 (both quotations).

[89] Analyses of histological excisions indicate that variations of cell forms in the layers parallel differences in the arrangement of nerve fibers in the cortex . Ibid, 220.

[90] Ibid.

[91] "*Verrät sich in der ersten dieser Erscheinungen eine zuhehmde Erleichterung der Erregungsvorgange infolge ihrer häufigen Wiederholung, so legt die zweite die Annahme nahe, daß unter geeigneten Bedingungen die Reizung innerhalb der zentralen Substanz neue Bahnen einschlagen kann. Diesen letzteren Übungserfolg kann man daher auch, um ihn von der direkten Übung durch Funktionswiederholung zu unterscheiden, als Bahnung bezeichen*." *Grundzüge,* sixth edition, 140-141. "Bahnen" literally means a carving or channeling out, but I have kept Titchener's "pathmaking."

[92] Titchener trans., 101. ""*Die Leitungsvorgänge in der zentralen Substanz uberhaupt nicht in feste Grenzen eingeschlossen sind, und daß daher Elemente, in denen zuvor die Erregungen gegenüber den gleichzeitig stattfindenden Hemmungen verschwanden, unter den durch den Hinwegfall der seitherigen Leitungswege eintretenden neuen Übungsbedingungen neue funktionelle Verbindungen eingehen können*." *Grundzüge,* sixth edition, 141.

[93] Titchener trans., 101.

[94] Titchener, trans., 161. "*Auf solche Neben- und Zweigbahnen weisen inbesondere auch noch diejenigen Erscheinungen hin, in denen sihc der Übergang von einer Leitungsbahn auf eine andere, also die Existenz einer Verbindungsbahn zwischen verschiedenen Leitungsbahnen zu erkennen gibt*." *Grundzüge*, sixth edition, 207.

[95] Ibid, 163.

[96] According to Wundt, simultaneous movement manifests itself in simplest forms like bilateral locomotion. Transference in this case way go form one side of the myel to the other, and indicates that co-excitation within the motor path may become a functional connection, or part of habitual movement. Titchener, trans., 162.

[97] Wundt, Titchener, trans., 4. Also, in the sixth edition, Wundt writes: "*Indem dagegen das Wesen des Experimentes in der willkürlichen und, sobald es sich um die Gewinnung exakter Beziehungen handelt, in der quantitativ bestimmbaren Veränderung der Bedingungen des Geschehens besteht, wird schon bei den naturwissenschaftlichen Aufgaben die experimentelle Methode überall zu einem unentbehrlichen Hilfsmittel, wo es sich um die Analyse rasch verlaufender, vergänglicher Erscheinungen, nicht um die Beobachtung relative constant bleibender Objeckte handelt*." *Grundzüge*, sixth edition, 5.

Chapter Two:

Theorizing the Psychology of Culture:

Wundt's *Völkerpsychologie* and its Role as Intellectual Source

This chapter outlines what happens when nerves gain a history. From the time he began his career in experimental psychology, Wundt never tired of warning his reader that experimental methods and techniques could not uncover higher mental function. That subject matter was the office of *Völkerpsychologie*, a comparative method of cultural history that framed psychological development as resulting from distinct trajectories of adaptation to certain spatial conditions among a group.[1] Wundt transferred theories of nervous formation to histories of culture to support his argument that shared thought processes in a group were culturally inculcated and arose out of shared patterns of nervous response to particular contexts.[2] While *Völkerpsychologie* did not become a psychological method, its connection to the lab gave the outlook considerable authority that fostered its adoption by sociologists, anthropologists, ethnographers, and art historians.[3] Scholarly representations of Wundt as a doyen of psychological normalcy omit the way in which the *Völkerpsychologie* challenged the notion of a single mental standard from within its institutional heart.

Wundt did not invent *Völkerpsychologie*, but he contributed thousands of pages to its discursive presence in intellectual culture during the first two decades of the twentieth century. He had begun lecturing and publishing on the topic as early as 1859. These early forays preceded his massive final opus, in which he analyzed cultural forms such as

language or myth separately in particular segments of his ten-volume *Völkerpsychologie* (1900-1910), which he followed with a single volume synthesis of its findings, *Elemente der Völkerpsychologie* (1912, English translation 1916).[4] Wundt's different approaches to his own cultural studies made his *Völkerpsychologie* a dynamic method. If the ten-volume *Völkerpsychologie* operated under a method of longitudinal analysis, by which one isolated and traced the development of a specific cultural form, such as language, "after the usual pattern of general psychology in its analysis of individual consciousness" and nervous development, then Wundt's *Elemente* was a more transverse analysis of cultural practices.[5] Wundt's *Elemente* fulfilled his call for an integrated analysis of culture "in the total interconnection of its phenomena" that would posit synchronic cuts across the diachronic stream of development.[6] *Elemente* was also a more popular read than his ten-volume juggernaut, which is plodding work even for the specialist.[7] Consequently, in order to clarify the key tenets of *Völkerpsychologie* as they may well have appeared in their original contexts, I will in what follows refer most often to the *Elemente der Völkerpsychologie* and include certain sections of the larger ten volume project in order to clarify particular points of Wundt's overall cultural theory.

Familiarity with this cultural turn of Wundt's physiological psychology is necessary for understanding why manipulating the structural principles of his theories became such a potent method in radical art practice. Following initial discussion of the grounding concepts of this method, my outline Wundt's *Völkerpsychologie* has three steps that will enable subsequent examinations of artistic approaches to it and his *Grundzüge*. First, I focus on how Wundt described the mentality of "primitive" peoples—their consciousness, language, and art, all of which became major sources of interest for

avant-garde artists. Second, in order to illustrate the breadth of Wundt's ideas in the historical context, I briefly compare the different usages of his ideas in the very different theories of sociologist Emile Durkheim and ethnographer Franz Boas. Third, I return the Wundtian dimension of cultural theory to debates surrounding empathy, including Wilhelm Worringer's groundbreaking *Abstraktion und Einfühlung* (1908). Worringer's selective reliance on Wundtian theory exemplifies the reshaping of the psychologist's ideas that form the subject of later chapters.

Central Notions of the *Völkerpsychologie*

Wundt's *Völkerpsychologie* departed considerably from earlier versions of the method in German intellectual culture.[8] He drew on early definitions of the term "*Völk*" which denote a cultural group that preserves experiences collectively.[9] For Wundt, the cultural dimension of *Völk* was the "decisive factor underlying the fundamental creations of the community."[10] *Kultur*, then, concerned the ways in which a *Völk* preserves its collective experiences and includes not only art, but equal shares of language, religion, and custom.[11] This sense of *Völk* entered philosophical discourse in the writings of philosopher and poet Johann Gottfried Herder (1744-1803), who described the notion as a series of social conventions that arose out of interpersonal relations among a group, rather than from exercises of power over a community. Herder made language the essence of the *Völk* and wrote on the way it shaped the individual, who then felt that s/he was a partial manifestation of the overall *Völksgeist*, or collective idea of society and social values among a people.[12] Another earlier figure who informed Wundt's work on culture was the philosopher and diplomat Wilhelm von Humboldt (1767-1835), who

extended Herder's notions by arguing that language was a gateway to other interconnected social phenomena. The psychologist Moritz Lazarus (1824-1903) coined the term *Völkerpsychologie* itself in 1851 and with the philologist Heymann Steinthal (1823-1899) began a journal dedicated to the concept (*Zeitschrift für Völkerpsychologie und Sprachwissenschaft*), which attracted many of the best minds in Germany, including Wundt and the sociologist Georg Simmel, both of whom studied with Lazarus.[13] Ultimately, Lazarus and Steinthal took a more positivist direction in arguing that the individual's mind was the only objective reality, which in turn formed the keystone of socially shared ideas.[14]

In contrast to this earlier favoritism of the individual, Wundt placed far more importance on the reciprocity between an individual mind and a shared system of customs or activities which fostered phenomena of cultural inculcation. Intending that his text would create a shift in focus, he introduced his *VP* by describing how it studies "mental products which are created by a community of human life and are, therefore, inexplicable in terms merely of individual consciousness, since they presuppose the reciprocal action of many."[15] Culture shaped a person's nervous system so that it resembled the nervous systems of other people in the group. This shared shaping guided the group's interactions with space and with each other. Physiological commonalities formed the basis of collective thought patterns. As Woodruff Smith has forcefully summarized, "Culture was no longer a consensus among individuals, an aggregation of ideas, words, and so on, that were passed on by persons of one generation to those of another. Instead, the mental structures of individuals were literally *part* of the larger culture."[16] Wundt's understanding of the formation of these structures relied on the

mechanics of nervous change outlined in the *Grundzüge*. But in the *Völkerpsychologie*, nervous mechanics became the shared bases of collective thought and will (*Gesamtwille*).[17] Wundt used his earlier work to frame the ways in which group expression relied on shared nervous reactions that were the basis for divergent ways of moving, experiencing, and knowing the world.

In contrast to the *Grundzüge*, which presented a single model of nervous and mental development, Wundt's *Völkerpsychologie* used this same base physiological causality and generated a prismatic view of cultures that adapted by the same means but to different ends. He described his intentions behind applying physiological psychology to a *Völk* in plain terms: "The basis of a philosophy of history should henceforth be a psychological history of development." [18] In a study of psychological history, neural structures form as variant modes of base causality and upward structuration, but as the basis for higher mental function, these structures will grow as forms of specific reaction to the demands of a certain context.[19] Wundt argued that all facets of human culture are "mental processes or the expression of psychical activities," but different trajectories of nervous development provided the basis for the different modes of psychic function in various contexts.[20] Wundt correlated contextual traits and base physiological causality as the basis for understanding the developmental relativity of the human race, cultural differences, and the stability of the human mind in a certain context.

Wundt's cultural history challenged mainstream social evolutionist theories of his time, but a brief survey of his overall sense of history shows that it nonetheless began with general evolution before giving way to myriad forms of specific evolution, or unique modalities of adaptation. He argued that every culture fit into one of four broad

developmental levels of world history: primitive, totemic, an age of heroes and gods, and a currently unfolding phase of advance toward humanity. Based on this general trajectory, he defined primitive culture as one that "approximates most nearly to the lowest mental achievements conceivable within the limits of universal human characteristics."[21] As Wundt construed the relation of historical experience and mind as a selective ordering out of the chaos of primitive experience, totemic cultures displayed a circle of ideas in which the animal rules man. Souls of the dead dwelt within animal ancestors and were the organizing vehicle of society, tribal division, and forms of family. The age of heroes and gods arose from the presence of human rulers in totemic tribes. Chieftains gained power in a community and assume military organization as a result of wider conflicts with other tribes. These conflicts led to developments of societies into states. Battles or other tasks of state guidance caused some men to attain powerful stature, which made heroes take the place of the totemic clan elder, shaman, or tribal chieftain. A political form of statehood gave rise to a change in art forms that exalt the hero. In the Homeric age, forms of language became modified and enriched in order to fulfill this expressive need.

Formative (*bildende*) and dramatic art follow changes in these epic forms. Wundt's language in his description of art from mythic cultures offers an important distinction between art from these groups and earlier civilizations. *Bildende Kunst* generated an idea of artmaking as a person-oriented form of self-improvement or *Bildung*, with the artist as hero. New customs emerged, however, when the state displaced tribal institutions.[22] National heroes and religions came into being. In this new mythic religious system, heroes and gods were idealized as personifications of natural events, and heaven became a more ideal version of earth. The fourth period received a rather general discussion, because for Wundt, even the most advanced cultures were still in it. This period described an advance toward humanity or an age that is emerging. It began, as he understands it, with a fall of barriers that separate religious views, which led to a

more encompassing system of understanding.[23] All three of these stages, then, reflect how limited human minds managed larger patterns of experience through shared images and concepts.

The social Darwinism (or Hegelianism) that this series and definition may suggest was not, however, Wundt's main focus in the text.[24] Historian J.W. Berry has made the crucial point that "*in principle, for Wundt, the differential valuing of each age was not a necessary defining characteristic*."[25] He framed adaptation as local, rather than general, which was far more complex than any unilateral trajectory.[26] Suspicion of social Darwinism is apparent in Wundt's description of how "constructions of the character" of the "primitive" have always been ideals that indicate certain periods of Western history, so that "to an age that is satiated with culture and feels the traditional forms of life to be a burdensome constraint, the state of nature becomes an ideal once realized in a bygone world."[27] Despite his enlightened claims about constructions of "primitive" culture and his establishment of its diversity, Wundt looked at other cultures according to his own theories of physiological psychology, but he focused more heavily on the way in which physiology could explain the variability of group psychology. Regardless of this general teleology, he focused most heavily on the diversity of cultures by using his earlier studies of the nervous system as an enabler of physiologically based intellectual diversity.[28]

This broad reliance on psychophysiological causality allowed Wundt to posit different kinds of possible relations among cultures. A historian began with exterior cultural manifestations—language, art, myth, and custom—and used this analysis to develop an inferred level of internal development in general physiology. Cultural advancement initially relied on the shared forms of nervous structures—i.e., the degree and kind of complexity with which nervous physiology has become habituated to operate.

Members of a community expressed, emphasized, and managed these experiences through cultural practice.

Formation of communicative and expressive modes in world culture fascinated Wundt. He based these modes on the most rudimentary levels of physiological function that were gradually impressed in a person's memory to the extent that communicative expression became automatic or non-volitional. As Kurt Danziger has argued, a central concern of the entire *Völkerpsychologie* was the plotting of how in different cultures, one finds entirely different manifestations of movement process and mental operation in the manner of ascending from a lower level of reactive expression or "drive movement" (*Triebbewegung*) to any volitional or discretionary process (*Willkürbewegung*) that eventually becomes automatic.[29] According to Wundt, structures of nervous stimulation varied with each context, so that automatic (non-volitional) thoughts, behaviors, and reactions were based in rudimentary patterns of movement at the cultural level. Customary action formed the basis for experience of culture and its ideas or values, which then express higher end intellectual qualities among a group. Art and life were inextricably connected, but not at the level of an observable poetic. All cultures formed group practice, but according to particular standards that they themselves established, in order to reinforce values and placate anxieties. Wundt framed these groups as subcollectives, or segments of the overall world population that developed entirely different formats of collective thought processes.[30] A subcollective's cultural activity showed variation by degrees of base physiological function.

The perceived limitations of experiment with regard to complexities of the mind motivated this cultural turn on Wundt's part. He believed that psychophysical phenomena

– in short, any phenomena that depended on processes other than those that were immediately sensory – could only be *estimated* in the laboratory and for a German scientist, estimation was not calculation; it was a partial immunity to technicalities of inquiry. Decades of experiment had given the mind new, multiple boundaries. Interactions with a particular site of experience played a major role in psychic formation, but the hermetic laboratory could not provide the exigencies of this cultural space and the multifaceted affects it had on the processing of stimuli and the formation of mental platforms. Wundt fiercely defended his belief that higher psychic functions were subjects of *Geisteswissenschaft*. Thus, experimental physiology could foster an understanding of psychic operation, but could never fully uncover the nature of how the mind worked differently in particular societies.

Wundt's limitation on the scope of experiment led to his eclipse. In contrast to cultural studies, his successors debated the extent to which *experiment* could uncover higher psychic phenomena as subjects of *Naturwissenschaft*, which contributed to a model of the human sciences as deterministic. For example, Wundt's student Oswald Külpe's act psychology practiced in his Würzburg lab set forth the tenet that testing and interviewing subjects about their thought processes could illuminate the entirety of consciousness. He relied on the positivist view that sense experience could provide the only true knowledge, in this case, the observations of the psychologist of higher mental function.[31] Wundt lambasted this endeavor as a form of induction, especially their studies of cultural phenomena like language, which formed the first topic of his ten-volume *Völkerpsychologie*.[32] For him, it was epistemologically untenable for a scientist to describe higher mental functions in an observed individual, because the scientist's use of

the same intellectual processes prevented the separateness that was necessary for an exterior description of phenomena. In his opinion, any communicative form was both an objective product of individual thought and a collective production requiring social-historical analyses, rather than experiments on the individual. This belief challenged positivist psychology from within its boundaries. Wundt's *Völkerpsychologie* created an intriguing twist in the history of physiological psychology, because he used the same basic causal structure of nerves that his colleagues were using as the base for more overtly positivist theories, but as the engine for a far more relativist venture.

"Culture" for Wundt meant a pattern of gestural interactions or bodily reactions among members of a group who may or may not have recognized the significance of these various patterns. Thus, bodily movement gave rise to culture, which affected the mental functioning of each individual. Part of that community influence was to be found in the group's cultural memory and through it, experiences of early stages in history continued to act on and resonate within the group's consciousness in ways that it could neither access nor understand, but only express.

Superficially, this outlook may seem to resemble traditional analyses of visual representation, but its basing of culture in bodies and nerves rather than in concepts gave the method an entirely different epistemological foundation. Comparing Wundt's overall *Völkerpsychologie* to the better known analytical methods of the German art historian Erwin Panofsky (1892-1968) facilitates an understanding of the ways in which Wundt's work differed from more familiar cultural discourses. Wundt and Panofsky diverge in terms of where each thinker placed the basis of his overall analytical method. Panofsky had a three-step process for interpreting visual representation: identification of objects,

description of subject matter (iconography), and establishment of social significance for the subject matter (iconology), which established the work as a manifestation of a culture's values. In the first stage of his process, Panofsky relied on "familiarity with objects and events" as the necessary initial "equipment for interpretation" in his process.[33] In comparing the graph from Panofsky's 1939 essay "Iconography and Iconology: An Introduction to the Study of Renaissance Art" to the analytical structure of Wundt's *Völkerpsychologie*, it becomes clear that Wundt would have required one more level prior to Panofsky's first step of "pre-iconographical description," a level that problematized the art historian's assumption of cognitive transparency (fig. 6). For Wundt, familiarity depended entirely on prior experience, which meant that its equipment had to be built *physiologically* before it could enable Panofsky's viewer to recognize, much less understand, anything in an object.

As the psychologist might have it, recognizing that culture indicates a particular and communal nervous orientation as the basis of social values would initially distance an outsider from the basic essence of cultural production. That production was nerve-based, rather than conceptual. In this alien situation, one's nervous makeup gave him/her different "equipment for interpretation," so that in the face of art from outside one's own culture, the resulting forms would be, indeed had to be, relatively unrecognizable, if not patently bizarre. Being puzzled or shocked meant that one was before an exemplar of neurophysiological otherness based on alternative patterns of action and sense intake. The people who made it moved in another way and consequently thought differently.[34] Meaning in the visual arts did not necessarily have the transparency of sensory intake that Panofsky posited as the basis of his schema.[35]

Shifting points of contact with cultural products from cognitive transparency to acknowledgement of altered movement patterns triggers a focus on reading significance in the movement-based rhythms of a work's production, rather than a focus on illustrated concepts. In the Wundtian view, rhythm—an ubiquitous term in the *fin de siècle* and most of the twentieth century— instanced the projection of certain shared nervous structures in a group. Wundt's work made it a qualitative descriptor of creative regularities in modes of expression that were particular to certain cultures *and* a quantitative term of mutable physiological substance within oneself. At the level of culture, rhythms of action in one's body as part of culture produced alternative expressive forms of language, plastic art, myth, and customs of all kinds as different but consecutive emanations from the shared nervous structures of a community. Rhythm did not equate all the arts in Wundt's work, nor did it present the arts as immediately relatable.[36] It was, however, the essential means by which a person absorbed physiologically the patterns of action in a group that gradually became impressed with thoughts and emotions.[37] Rhythm was a pattern of impulses in space and the result of a certain conductive structure in a person's nervous system. Rhythms in a culture connoted particular nexi of harmony between the formal movements in a cultural product and nervous structures of a group.

Wundt's *Völkerpsychologie* relied on a high degree of conjecture regarding the probable physiological nature of different cultures. He was unequivocal that probability was the "only guide," for successful descriptions of culture that are not projections of aesthetic value from an outside observer.[38] But, like any construct of probability, one could always establish dominant conventions of cultural forms or shared beliefs. In Wundt's case, the bases of these forms were phenomena of nervous change. He described

how the decidedly hypothetical claims of his *VP* were nonetheless "in greatest consonance with the sum total of the known facts of individual and folk psychology."[39] This supporting foundation of *Völkerpsychologie* appears in Wundt's focus on the different qualities of movement that indicate various collective structures of nervous operation. Following an ethnocentric trend of his moment, Wundt declared that "primitive" cultures (*Naturvölker*) were the most palpably in contact with the immediate rhythms of bodily movement and that this openness allowed for a more noticeable interconnection of their different art forms, because different media had not departed from one another according to abstract language that was above immediate experience. Wundt believed that interconnection came from the fact that so-called primitives lacked higher cognitive functions, which consequently kept their cultural productions closer to a more rudimentary platform of reactive movement. This premise became rich fodder for particular approaches to it by an entire regiment of different avant-garde artists over several decades, so it behooves one to spend some time outlining in detail how Wundt framed primitive culture.

Representing the "Primitive" in the *Völkerpsychologie*

Omniscience of psychophysiology carried over to studies of culture, rather than aesthetic judgment, enabled Wundt to frame primitive culture as a diverse series of sets of cognitive reference points to ideas that grew up around them. In his work, physical determinism could not be of much assistance in recreating a historical past. For example, measurements of the brain cavity or other anatomical data about prehistoric man "can give us no information concerning the psychological aspect of the question regarding the

nature of primitive man."[40] Thus, prehistoric primitive cultures were not psychologically lower than present-day primitive cultures, nor did one necessarily precede the other in a model of evolutionist causality. The data itself, in the form of prehistoric objects, gave no sense of a comparatively lower psychological standing.

Ultimately for Wundt, what remained from primitive culture to the present experience indicated a more surprising premise, which is "the great stability of primitive culture in general."[41] These cultures expressed relatively similar psychological states and were not communities that necessarily sought "something better" in development toward any other norm. This correspondence of prehistoric cultural forms to primitive cultures that were contemporary to modern European cultures indicated "a high degree of permanence" in the category of primitive culture."[42] Resisting the historical route allowed Wundt to avoid a single trajectory of general human evolution and enabled him to see primitive culture as a worldwide psychological category.

Thus, according to Wundt, no single culture is the most primitive, nor is there a region from which all human life sprang. Positing such an origin would obscure the more crucial matter of the way in which a culture manages its experience. Thus, in the context of primitive culture, cultural productions were movements that indicated a certain neural level and particular psychological developmental disposition. More intriguingly still, the basic human physiology of the nervous system was generally similar for both primitive and modern man, which led Wundt to argue that "the intellectual endowment of primitive man is in itself approximately equal to that of civilized man . . . primitive man merely exercises his ability in a more restricted field; his horizon is essentially narrower because of his contentment under these limitations."[43] The relatively similar intellectual level of

different cultures results from a particular developmental structure of the nervous system that gains internal complexity out of reaction to different spaces.

Wundt framed primitive culture as a general neurophysiological level manifested in particular nexi of movement patterns that did not disappear into the distant past.[44] Diverse groups seemed to show pockets of this general (not isolated to one culture) and specific (dictating a precise nervous schema in consciousness) organically fundamental state of mental history.[45] Yet they were "primitive" not because they were living fossils of earlier states of humankind, but because they organized their experience in particular ways. Their culture was by no means static, but the developmental level was, because they were content with it. Given their state of nervous development, primitives were most open to introductions of change that happened most often by chance. One may not immediately think of primitivism in connection to chance, but in the context of Wundt's work, and, I shall argue, for the avant-garde, the two notions were inseparable.

Primitive Chance

Wundt argued that no cultural form is invented on the spot and in the most primitive contexts, cultural products resulted from a process that began with a chance occurrence. The rudimentary neurophysiological level of primitives made it far easier for them to absorb chance encounters than it was for a modern subject, whose higher intellectual categories would inhibit the intake of such stimuli. In Wundtian theory, primitive man lacked the forethought for invention and the intellect for systematic calculation and planning:

> The thinking of primitive man is almost exclusively associative. Image follows upon image in the order in which these appear to consciousness. Thus, the thinking of primitive man is almost exclusively associative. Of the more perfect form of combining concepts, the apperceptive, which unites thoughts into a systematic whole, there are as yet only traces, such as occur in the combination of separate memory images. [46]

Wundt was unequivocal in these lines that openness to chance occurred with greater frequency due to the dearth of apperception in primitive mental operation. As outlined in the previous chapter, apperception was a cognitive strategy that lends sequence to thought based on prior experience fostering a sensory fixation of attention. In contrast to the basic intake of sense impressions, it was a higher level cognitive act of isolation and constancy in sensory experience. It relies strongly on nervous habit. Apperception can be visual or aural, but above all it depends on how one relates to objects in space. In more advanced cultures, these higher cognitive levels were based on the inhibitory resistance to the surrounding flux of stimuli that was the office of habitual conduction paths. Without the developmentally ascendant faculty of apperception, primitives have less inhibiting intensities to new stimuli and a greater ability to alter collective mental function with haphazard sensory intake.

Impressions collided in primitive mental operations of association, rather than fall into expected order. As it appears in the lines above, association in primitive cultures was not a rational act of conscious connecting based on perceived similarities, which is what the term means in earlier British philosophy. These associations were more the result of happenstance in a temporal or spatial. Wundt believed that primitives experienced the

sensory flux of the world solely through the physiological faculty of association in the cortex between different sensory areas.[47] Without these faculties of apperceptive fixation, isolation, and duration, however, primitive cultures were far more open to chance experiences that they could incorporate into their practices of everyday life. The gradual discovery of beneficial consequences that began with chance would give rise to deliberate practices that fixed beneficial forms by means of repetition. But without the capacity for abstract thinking outside the phenomenal world, these habits could change more drastically in the face of new chance occurrences. Thus, the neurophysiological stability of primitive culture was of a sort that made it far more mutable than more "civilized" societies.

That chance was easier for primitives to absorb into their regimen of cultural practices was one factor that contributed to the diversity of primitive culture, for without abstract thought, group thinking came to rely far more heavily on particular spatial conditions. According to Wundt, a quality that was revealed by chance or accident—for example, the functional asymmetry of the boomerang—encouraged the primitive to copy "as faithfully as possible those implements which most perfectly exhibited this characteristic."[48] According to tenets of habit formation, repeated contact with advantageous qualities enabled gradual fixing. The boomerang began as a form found by chance when a native Australian threw a curved stick and received an interesting, albeit painful, surprise when the object returned. Learning to use the tool was then a gradual process of becoming habituated to a new form in space involving construction of a style for the new object out of physiological coordination.[49]

Chance could also give habitual encounters novel experiential qualities. New awareness of pre-existent natural phenomena occurred by ascending complications in the nervous system. For example, walking through the forest led to the process of forming bows and arrows. In this case, the initial responses were to observed natural phenomena: "Having first observed the powerful impulsive force which a rod gains through being bent, it was a simple matter to render this force permanently available by bending the rod back and binding its ends together."[50] The "common form" of the bow encapsulated a series of responsive practices to a repeatedly observed natural phenomenon.[51] Gradual expansion on this general structure generated variations of a more advanced nature, such as increased function: "In order that such a bow may be bent back more easily, some people of a more advanced culture construct it out of several layers of wood, horn, sinew, or the like."[52] Complications to the form initiate the formation of new paths in the nervous system. Reliance on the initial pattern of occurrence was obviously key. Without it, one would lose the anchor of memory and return to throwing rocks. The arrow relied on a different system of observation that offered new dimensions on experiential patterns.

In later cultures, these weapons yielded data concerning aerodynamics and physics, but primitive men knew nothing of these fields. Feathers on the end of a bow guaranteed its accuracy as the "resultant effect" of this modification to the anchor shaft.[53] How did primitive man foresee an effect of modification when he had no knowledge of the mechanics that generated this resultant effect? Without the continuity of apperception, an entirely different structure of thought would unfold based on

corresponding analogies between perceived movement qualities, rather than optics or logic.

In Wundt's view, the primitive mind made connections based on the different ways that he moved and thought. Wundt argued that primitive man most likely attached feathers to the flying arrow so that it encapsulated observed qualities of "a flying bird that pierces the air by the movement of its feathers."[54] In making the arrow, primitive man copied "the mode of movement of the bird" with no knowledge about how "he was causing movement in a mechanical way."[55] Wundt's example is quaint, but its consequences are explosive. This notion of the copy differs from a visual representation, because it is based on a perceived quality of movement, rather than a fixed, retinal image captured in apperceptive focus. Capturing a quality of movement and associational material (feathers) was enough to create an image of the bird for the primitive, for whom "the image of a thing is in reality always equivalent to the thing itself."[56] The plastic object encapsulated an observed process of movement. It was a new enactment of a process, rather than a re-presentation of a fixed mental image. In this way, nature supplied primitive man with the "patterns" of his implements, weapons, and vessels.[57]

The observed quality in nature was a pattern that connoted an experiential continuity of ambulatory phenomena, rather than an observed, concrete image like a checkerboard. It described certain kinds of making based on linkages of movement and thought that corresponded only as sensations of movement. The availability and nature of these patterns would depend on what sort of neurophysiological level one had. Different structures revealed various sequences of experience as meaningful. Wundt's notion of pattern in nature denoted the continuity of spatio-temporal experience of phenomena to

which one responded, if the phenomena were beneficial.[58] Chance discoveries initiate new forms of practice, especially as it concerns relationships with objects. [59]

Wundt posited chance as a primary fixture of primitive experience and based this openness on contextually variant systems of rudimentary movement that enabled subsequent manners of experiential combination and mental sequencing that differed in style from trajectories of modern thought. Wundt found these qualities of distinct movements to be a palpable capacity of primitive language.

Language as Movement Pattern

Paralleling his work on the psyche and culture, Wundt rejected the notion of language as discourse—i.e., as a set of abstracts or concepts that one can apply from above over and apart from the dynamics of linguistic formation. Language was neither structural nor archetypal, but a form of emanatory bodily movement or gesture that expressed cultural inculcation in a manner that allowed subjects to change language through pursuit of new action patterns. In contrast to Durkheim or Freud, Wundt attached major importance to language as a cultural phenomenon.[60] It should not surprise that Ferdinand de Saussure (1857-1913) was a regular attendant at Wundt's lectures on language, given before, during, and after composition of the *VP*.[61] Yet this Wundtian dimension of language – so familiar to the avant-garde – has all but disappeared from the historical record. In contrast to Saussure, Wundt thought that language had to be understood as being totally reliant on spatial phenomena of bodily movement.[62] Wundt argued that "language is bound up with thought," but in a manner that enabled one to infer differences in its direction and form throughout cultures.[63]

Familiarity with Wundt's overall theorization of language in the VP provides the necessary backdrop for understanding his specific thoughts on primitive language. Framing language as a collective, gestural process hinged on describing vocalization as a form of expressive gesture or motion known as articulatory movement (*Artikulationsbewegung*).[64] Speaking was not just a selective exercising of a pre-existent structure. It relied on moving organs, so for Wundt, speech was always a bodily process of created sound (*Laut*) that was, in fact, a sound movement (*Lautbewegung*) made in reaction to an outside impression.[65] As a process of moving sound, speech arose as a reaction to spatial phenomena and, at its most rudimentary level, was an attempt to replicate sounds heard in the environment (*Lautnachahmung*).[66] Speech was, in fact, a movement of articulatory organs, which made it a kind of gesture that most often occurred in coordination with other kinds of movement. Based on these two factors, Wundt postulated that at its base, all language had connections to a rudimentary level of initial sound gesture (*Lautgebärde*) that formed the basis of all language in its beginnings as reactions to heard and felt sound.[67] These movements of articulation depended on the nature of space and the relative level of nervous development in the collective, but all languages began at this basic level. Members of a community shaped utterance according to perceived necessities that were initially reflective of the context in which they lived.

In the sphere of culture, language rose instinctively but entirely in accordance with the Wundtian notion of instinct as an expression of a culturally instilled pattern of action.[68] As a form of movement, language had more conspicuous and immediate linkages to other socially shared patterns of expressive movement and emotion, like art or ritual. Framing language as a gesture that one learned made its nervous energies into

forms instilled by culture in space rather than mind. These characteristics allowed utterance to "reveal the exciting of subjective feelings through the impression" and simultaneously "reproduce the feeling of the excitational process (*erregenden Vorgang*) itself."[69] For Wundt, this push to mimic within rudimentary language exemplified the way in which all utterance was a culturally ingrained manner of movement-based coping and orientation in a collective, which created a structure for knowing and feeling a certain way about these experiences by reproducing exterior phenomena.

Wundt assumed an educated reader who would have known to connect these theories to earlier formulations of language outlined in the *Grundzüge*. This sense of language as collective practices of movement had strong bases on laboratory experiments. He was able to base the social level of linguistic construction in the nervous system by supporting it with his earlier studies of how different conductions of sense data converge at a particularly high level in the speech centers. [70] The high level of manifold representation in the speech centers bolstered Wundt's argument that utterance was a reactive gesture of articulatory organs made in reaction to sensations. [71] At the social level, communal life strengthened as it continuously reenacted these experiences in their ambulatory and linguistic forms, and was in turn strengthened by language that elevated the community above associations that concerned only momentary needs.[72]

Nerves were the basis of language, and these fibers were never still. Speech centers could change with the introduction of any form of movement, because the speech center was open to functional disturbances that modified the conditions of conduction and with them the actual conduction paths. Cultural inculcation played a role in these formations, but that culture could change at rudimentary levels of sense intake in

accordance with specific adaptation. The mutability of the nervous system will alter how and to what formal ends the subject's organs of articulation will take. Framing language as a form of bodily movement implicated the most essential factors of the nervous system and its modes of mutation. The nature of this mutability gave culture constancy. As neurophysiological practice (*Übungsphanomene*), language was readily open to small tweaks and manipulations, but its overall development progressed more slowly than other facets of culture. Consequently, primitive forms of thought could persist in forms of external culture even when the culture was very advanced.[73] Understanding language as a movement allowed Wundt to associate it more readily to other modes of linguistic expression besides speech.

Gesture language (*Gebardesprache*) involved the expressive movement of the limbs that a person makes in emphasizing ideas. Linguistic interactions among people in a culture displayed these two different forms of movement that are most closely linked in primitive language, because these groups did not have abstract language that was independent of immediate experience. In a connection that fostered his view of utterance as a form of movement, Wundt described how gesture language rose immediately in relation to spoken words as a dimension of emphasis. As forms of movement, both voice (articulatory movement) and gesture cooperated in conveying an emotional energy to meaning. Gesture language was an expressive means between individuals that occurred at the lowest and highest cultural levels. These forms of communication consisted of expressive movements that were imitative or pantomimic in character and formed the means for communication of thought. When this practice occurred in modern cultures, it "may nevertheless be regarded as primitive, since it is actually formed anew before our

very eyes."[74] Languages of gesture marked the legacy of more primitive cultural stages in more advanced cultural stages. It was always an original, rudimentary, and thus primitive form of communication that in advanced cultures did not depend on primitive conditions, as was the case in gesture languages of primitive cultures.[75]

Gesture language communicated and emphasized meaning contents by connecting to utterance a new form of energy that was often invented on the spot. In historical context, the general belief in Wundt's time was that gesture languages arose from an impulse to communicate intellectual processes or voluntary reflections to other people. But for Wundt, observing gesture language at its origin yielded a set of entirely different motives. Instead of intellect or reflection, original gesture languages were irrefutably the result of "emotion and the involuntary expressive movements that accompany emotion."[76] It was an instinctive form of emphasis, but here, as elsewhere, instinct implied the root causality of movement forms in cultural influence. Emotion came from immediacy of action in which communicative intention was absent, but it nonetheless triggered a response that forged "common thinking in which impulsive movements are more and more displaced by voluntary actions, and ideational contents, together with the corresponding gestures, enter into the foreground of attention."[77] At its root level, communion with another was straightforwardly a base nervous reaction that rose up in immediate relation to the nature of an emotional, instinctive, and inculcated reaction to space. At this higher end of communication, ideational content allowed emotional gestures to become volitional in expressing individual experience to others by an exchange of thought in language. Gradual transition from emotional and impulsive movement (*Triebbewegungen*) into other, more voluntary (*willkürlich*) actions relied on

processes of practice, habit formation, and any development of higher mental functions out of reactive movement would correlate to shared structures of experience and expression.

One would make instinctive gestures in a manner that was entirely reliant on the way in which one was accustomed to moving and within this range, the nature of denotative possibilities restricted gesture language to signs for ideas that were only "capable of perceptual representation," or anything that the senses could immediately absorb.[78] The referent would depend on the context of the ideas being communicated. For example, the denotative properties in a gesture for walking might indicate the action or the course that one takes.[79] Complete availability of gesture language to perception—it reflected nerve motion almost without reference to abstraction—allowed all of its elements to remain primitive (below high levels of mental function like intellect). Wundt deflated the social Darwinist belief of Western intellectual superiority with respect to the initial sources of its communicative means, which were not intellectual but sensory and above all ambulatory.

Wundt's lengthy description and analysis of gesture language shifted understanding of language formation and use in two ways. First, the grammatical rules of expression were not hidebound. These structures could change; not as a mere shift in discursive archetypes, but in nervous tissue. The second, more intriguing premise dictated that the nature of expressive communication changed most readily and noticeably through new forms of movement. The use of communicative gesture in any society did not rely on preexistent syntactic categories, but most often arose improvisationally, in direct relation to an utterance that was a movement reaction to sensory phenomena.

Wundt saw this duality of gesture and voice as a united form of movement, in which an invented gesture reinforced the meaning contents of language.

Based on the immediate connection of utterance to gesture language, and the conjoined nature of gesture language and emotion, Wundt postulated that primitives never thought outside or above the emotions. Ultimately, documents of primitive language illustrated that the content of primitive thought had two major elements of composition. First, direct perception of everyday life provided one category of ideas. The second category consisted of supersensuous ideas that "originate in feeling, in emotional processes which are projected outward into the environment."[80] This supersensuous content appeared in the form of sensible ideas, despite the unavailability of these supersensuous ideas within the seen world.[81] Emotions were not felt, but seen.

Primitive language effectively bolstered Wundt's characterization of language as a nerve-based movement system, because the neurophysiological practices of these cultures did not have the capacity to think outside immediate sensory content, which gave their language a disjunctive quality in which different words were separate reactive gestures stacked on each other. In primitive languages, grammatical categories never synthesized above immediate phenomena, which made primitive utterance more closely resemble base reactive movement in its lack of continuity.

Wundt's description of primitive language leads the modern reader to imagine that the primitive experienced the world as a sort of collage: this was a disparate grouping of distinct sensory events that the subject combined but did not synthesize into a separate whole upon which one could then reflect. Instead, primitive utterance relied on the bricolage of raw sense data in a brain that had not yet developed the faculties of

apperception (attention) or theories of causality. It has the fewest "fixed combinations in which the individual component parts have lost their independence," which meant that language was never detached from experience.[82] One sign could denote objects, actions, particles, or qualities. Wundt had argued that, in contrast to a Western language that consists largely of abstract concepts, primitive utterance and gesture languages were "entirely reduced . . . to separate perceptual images" which indexed a different pattern of movement in space.[83] In such movements, thought connects to separate objects in a reactive manner that was, to a modern Westerner, utterly non-sequential and discordant. Thus, while intellectual processes in the modern subject could occur above immediate sense data in a manner that gave to experience effects of filtering, convergence, and sequential unity, Wundt argued that primitive thought had no such faculties, because it only showed traces of apperception, which was the basis for development of higher ideas or abstract concepts. Perception and the recollection of these perceptual experiences governed the association of ideas that determined the habitual continuity that one perceives as the sequence of thought. Instead of the unity that abstract concepts gave to Western linguistic structure, then, in primitive thought, "image follows upon image in the order in which these appear to consciousness."[84] Particular nature of how a group brought distinctive sense images into discordant proximity was an exercise of articulatory movement would depend on how culture influenced a person to experience a particular space. He argued that the primitive "sees the image with its separate parts; and, as he sees it, so he reproduces it in his language."[85] Wundt described this form of thought as "concrete" in the sense that perceptual content far outweighs independent judgment or expressions of concepts. Thus primitive language would reflect the developmental level

of a socially shared bodily substrate that absorbed experience in a particular way. Without high-end faculties, the primitive cognitive event had no sequential continuity, but was instead a pile of disconnected sense data coupled with emotions that do not correspond logically to the manner in which a "civilized" subject can synthesize and focus on particular experiences of past and present.

Based on this formula of nervous alterity, Wundt saw primitive language as being essentially a series of disconnected movements coupled with emotion that generates sound movements "of monosyllabic words which follow one another in direct succession without any intermediate inflectional elements to modify their meaning."[86] Instances of cultural syncretism displayed these features of primitive language in the most conspicuous fashion, for these events involve subjects seeing unfamiliar objects. For example, in Togo, speakers of Ewe who had ever seen a pencil described it as a "stone-scratch-something," or a stone that one uses to scratch something.[87] Likewise, a nail was an "iron-head-broad." For Wundt, each element of these compound neologisms "stands for a sensibly perceptual object," and the primitive formed the concept "by arranging in sequence those perceptual ideas whose combined characteristics constitute the conception."[88] Devoid of grammatical distinction, such an apparently simplistic language revealed its true complexity as a simultaneous *bricolage* of "sensibly perceptual images" that broke a single concept into numerous distinct elements.[89] In its elasticity of denotation, primitive utterance was more akin to gesture language (*Gebardesprache*), in which, for example, a "gesture of striking may denote the verb 'to strike' and also the noun 'blow.'"[90] The component parts of these most primitive languages, in fact, were contrary to Latinate traditions of root words, because they developed by agglomeration

and agglutination, both of which were inherently spatial phenomena and connoted a gathering out of raw and impulsive movements.[91] For example, in the Ewe language, Wundt argued, even concrete empirical concepts like the verb "to bring" became the transitory chain "take-go-give."[92] A concept like the cardinal direction west met with other complications. A Togo person expresses this word by saying "sun-sit-place," in which "there is required not only the sun and location which we must give it but also its act of seating itself."[93] All of these traits gave primitive spoken language, in its separateness of reactive articulations, a far stronger connection to gesture language. Indeed, for Wundt these two rudimentary forms of external culture were "absolutely at one" in the nature of movement experience that informed techniques of composition.[94]

The Body as the Source of Art

Consequently, Wundt made dance the beginning of all art and argued that primitives had brought this form to a high degree of perfection.[95] Wundt believed that primitive man was best endowed for this form of cultural expression because of his unique physiology: "The life of the forest, the climbing of trees, and the capturing of game qualify him for performances that would prove difficult to a modern art-dancer."[96] Dance was the most physical art form, and Wundt's primitive was best at it, because he was the most physical man, meaning that his nervous system had become habituated to more extreme, limber, and supple corporeal movements. But within this gestural potentiality were major concepts concerning how the movements of dance were the basis of all other cultural forms. Dance had its origins in the basic bodily movements of everyday life, in the way that song had its origins in everyday speech. For Wundt, the

origins of dance were rhythmic bodily movements that were learned and thus (to a person in the culture) natural reactions to the feeling of one's general atmosphere.[97] Crucially, Wundt argued that dance was the place where the rhythms of culture were least sophisticated (*reinsten*) and at the lowest levels; that is, it had the closest proximity to the rhythmic practices of everyday life and the most potent indicator of psychological processes.[98]

According to Wundt, in primitive dance, one often found very simple bodily movements that resembled basic gymnastic exercises (*bloßen gymnastischen Spielen*), but which had immediate connection to cultural ceremonies.[99] Thus, the most basic rhythms, which were found in the dances of a culture and manifested in movements, were the strongest manifestations of group consciousness, because at this simplest cultural level, one found less of a disconnect between everyday life and cultural expression in the means by which the group transmitted content through gesture. This particular combination of the seen and, more crucially, of the communally felt as seen, was rooted in a particular neurophysiological level and exemplified mystical thinking in which objects and processes of perception "are supplemented by other realities that are of a non-perceptible nature and therefore belong to an invisible realm back of the visible world."[100] Primitive art most clearly expresses these ideas. Ideas that form magical belief were projected into forms of external culture like art. Reciprocally, art "reacts upon magical ideas and brings about an enhancement of their motives."[101] As a gateway to psychological knowledge, dance provided the clearest manifestation through cultural expression of the mental life of a certain group, because it was the most inherently physiological form of expression. Rather than abstract thought, dance was a

manifestation of thought through seemingly abstract movements, which in fact held the essence of a group's beliefs. The communal (*gemeinsamen*) nature of dance generated a shared subjective life of pleasure, and its direct sources were movements and the accompanying sensations of these movements. This form of expression clearly benefited from group participation, which "enhances both the emotion and the ability of the individual."[102] Sensations of one's own movements were brought into harmony with and by assistance of sensations of other people's movements in the group. Participation in this dance was thus a physiologically grounded form of collective thinking and habit formation. Belief in magic became more intense when its quantitative generation by the group was systematized out of basic bodily movement that looked more like gymnastics to an outside viewer.[103]

At the earliest stage of dance, only the body was the medium. Neither masks nor music occurred. For Wundt, the most dominant accompaniment for the most primitive dances was the primitive vocal dance song that had "grown up out of selected natural sounds," or the raw material of sensory experience that one took up and selectively molded by repetition.[104] The musical or rhythmic nature of the refrain in sung speech "exalts and supplements the dance; when all parts of the body are in motion the articulatory organs also tend to participate."[105] All of the body's expressive faculties integrated to amplify expressive strength, and all people in the group performed this feat simultaneously, thus increasing the emotional attachment to certain movements.[106]

As in dance, primitives develop formative art (*bildende Kunst*) in direct connection to ideas of magic, which indicated that for them, magical phenomena appeared as sense data. Elements of formative art proceeded from these forms of

rudimentary and rhythmic movements, which began with linear decoration, pattern, and abstract ornament. The cutting or scratching that produced simple lines were the most rudimentary form of decoration.[107] Uniform repetition was the universal characteristic of primitive ornament, as a visual correlate to nerve structures within the community. Repetition represented the most rudimentary form of illustrating exterior culture and it was also present in primitives' habits of linguistic sequencing (image after image), the repetition of a word as the refrain in song, the unified movements in gesture (whether individual or group), and the phenomena of rudimentary repetition that generated pattern. The logic of these formative practices occurred as specific results of initial pathmaking that were communal and shared.

For Wundt, pattern was like practice, in that it "later becomes more complicated."[108] Combinations of whole forms or parts of forms aided in giving rise to this complexity. In other cases from ethnology, he interpreted simple geometrical patterns on objects not as simple decorative shapes, "but as representations of objects."[109] Arrangements of triangles or squares were, for the culture that made them, snakes or bees.[110] The "psychical process of assimilation" allows for the ability of a primitive man to "read concrete objects of this kind into his simple ornamental lines."[111] Assimilation was more prominent in primitive cultures, due to their protection from outside influence that made psychical assimilation more open to exterior influence.

This mode of abstraction relied on the physiological level upon which Wundt grounded all mind and experience. These arrangements instance a mental level within other basic forms of external culture and, subsequently, allowed viewers to "read into them, through imaginative association, the memory images of objects."[112] That this was

not deterministic is very clear in Wundt's expositions. Primitives could often draw in a more (Western) representational manner, so the need for geometrical ornament did not arise from inability. Dance fed the need to compose repetitive decoration. Wundt's *Elements* outlines this idea most clearly, positing,

> It was not inability to draw the objects themselves that gave rise to these primitive geometrical decorations. The decorations came first, and the memory images of the objects of daily perception were then read into them . . . Because of the character of his locomotor organs, primitive man repeats the movements of the dance at regular intervals, and this rhythm gives him pleasure. Similarly, he derives pleasure even from the regularly repeated movements involved in making the straight lines of his drawings, and this pleasure is enhanced when he sees the symmetrical figures that arise under his hand as a result of his movements. The earliest aesthetic stimuli are symmetry and rhythm. We learn this even from the most primitive of all arts, the dance. Just as one's own movements in the dance are an aesthetic expression of symmetry and rhythm, so also are these same characteristics embodied in the earliest productions of pictorial art – in the beginning, indeed, they alone are to be found.[113]

Both modes of practice were elemental rhythms of spatial interaction. Pleasure in the repeating of movements of the dance "at regular intervals" unfolded as the result of a habitually constituted "character of his locomotor organs."[114] As a direct corollary to the pleasure of repeated movement in dance, pleasure also came from creating rhythm and symmetry in formative art. The nature of the rhythm would instance a certain physiological structure and consequent psychological orientation, which could then

connect one to other perceived similarities regarding other cultural practices as consecutive dimensions of movement. These notions were topics of scholarly debate among ethnographers, sociologists, and anthropologists, and concerned the implications of this model for theories that addressed the mental and social lives of individuals and groups. Developing implications off Wundt's theories depended on how a reader shaped and framed his imposing work.

Variations of Collective Thought: Durkheim and Boas Read Wundt

Wundt's *Völkerpsychologie* had an attractive rhetorical strength for sociologist and ethnographers, because its findings were based on laboratory practice. For example, the French sociologist Emile Durkheim's theory of collective representation relied on the *VP* for his argument that group ideas existed only in the minds of those who had experienced a certain form of collectivist engagement or participation. In 1887, Durkheim visited Wundt's laboratory on a grant from the French Ministry of Culture, in order to learn firsthand how one could combine a study of the nervous system with a more philosophical and historical undertaking of human history as psychological history.[115] Shortly thereafter, he wrote a long essay on the overall workings of Wundt's lab and incorporated these ideas into his own work, especially for his well-known notion of collective representation.[116] Durkheim first addressed this concept in 1898, well after Wundt published on these ideas in his own journal, *Philosophische Studien*.[117] Durkheim does not cite Wundt, but it is clear that he borrowed heavily from the German psychologist. For example, in his landmark *Elementary Forms of Religious Life* (1912), he described the way in which collective representations "achieve their greatest intensity

when the individuals are assembled and in direct relations with one another, at the moment when everyone communes in the same idea or emotion."[118] One sees the basic philosophy of Wundt that ideas in culture are supra-personal. But Durkheim departed from Wundt when he argued that collective representations were by definition impersonal: "Whenever we are in the presence of a type of thought that presses uniformly on individual intellects or wills, that pressure on the individual reveals the intervention of the collectivity."[119] For Durkheim, intellect and, especially, volition were higher psychophysical phenomena; for Wundt, by contrast, the source of all supposed social facts was the continually fugitive nervous system.[120] Group ideas were continually changing and also were not amenable to unilateral formations of laws like those that the French sociologist pursued.

Durkheim relied on the contemporaneous studies of psychic causality in the work of French psychologists like Alfred Binet, Théodule Ribot, or Pierre Janet when he argued that one could conceive laws for societal function based on comparisons of social facts, which allowed him to judge whether a society was healthy.[121] Judgmental and especially pathological scrutiny became a major force in French sociology and appeared most prominently in the work of Gustave Le Bon (1841-1931). Both Le Bon and Durkheim saw the development of the individual as an inherently public process that depended entirely on a seemingly automatic and basically nativist absorption of social facts. The two thinkers also saw society as a metaphor of the individual mind, which implied both social unity and redefined the collective according to a standard of psychic health. Le Bon was particularly interested in how the masses had a common self-image, which then became attached to a charismatic leader as a sort of superego.[122] The

omniscient place of the psychologist in French constructions of pathology contradicted the *VP*, which held to a model of reciprocity in its tenet that individuals could alter society through an application of new movement patterns. Social facts could never become laws, for they were built on conditionalities of mutating tissue. For Wundt, the only real laws were those of the basic determinism of the nervous system, which were merely outlines for the mechanics of change. Base physiological phenomena like pathmaking or concomitant irritation were a far cry from Durkheim's top-down comparisons, for these processes were the basis for a multiplicity of adaptive schemas.

In contrast to Durkheim, who engineered Wundt's ideas into a positivist structure, Franz Boas appreciated the subtleties of the German psychologist's arguments. One sees his appreciation most predominantly in his fascination with the way in which cultures have different senses of what constitutes the quality of rhythm. Citing Wundt throughout his text, Boas expressed the views of the older psychologist when he wrote, "Rhythmical movements of the body or of objects, forms that appeal to the eye, sequences of tones and forms of speech which please the ear, produce artistic effects. Muscular, visual, and auditory sensations are the materials that give us esthetic pleasure and that are used in art."[123] As Boas expressed it, rhythm is not just a quality, but it depends on different quantitative structures of nervous orientation shared by makers of culture in a specific time and place. Rhythm was a particular quality of the body that Boas, like Wundt, connected to the symmetry of the human body: "Symmetrical notions of the arms and hands are physiologically determined. The right and left are apt to move symmetrically and the motions of the same arm or of both arms are often performed rhythmically and symmetrically from left to right."[124] Boas was fascinated by how many different forms of

rhythmic composition pervaded world culture, and for him this diversity was the result of different modes of specific, ambulatory adaptation and expression.

These rhythms of creation were in one's nerves and thus affected the production of other cultural forms that rose out of the movements of the same bodies in a certain place. As Boas argued in an earlier text, *The Mind of Primitive Man* (1911; German translation 1914), "In all these cases the form of reaction may depend to a slight extent on hereditary individual and racial ability, but it will to a much greater extent be determined by the habitual reactions of the society to which the individual in question belongs."[125] Thus, a key aspect of Boas's ethnography involved interpreting culture as based on shared neurophysiological structures in a group that provided insights into the ways in which "there are certain stimuli to which all of us who live in the same society react in the same way without being able to express the reasons for our actions."[126] Boas then explained this viewpoint with a user-friendly summation of Wundt's basic outlook toward the topic in his *Völkerpsychologie*—i.e., the basic functionality of physiological psychology being transferred to cultural history as an engine for appreciating relativism:

> In all these cases the custom is obeyed so often and so regularly that the habitual act becomes automatic; that is to say its performance is ordinarily not combined with any degree of consciousness. Consequently the emotional value of these actions is also very slight. It is remarkable, however, that the more automatic an action, the more difficult it is to perform the opposite action, that it requires a very strong effort to do so, and that ordinarily the opposite action is accompanied by strong feelings of displeasure. It may also be observed that to see the unusual

> action performed by another person excites the strongest attention, and causes feelings of displeasure.[127]

For Boas, obeying these customs involved the habitual associations of movement-based practices. He followed Wundt in positing that these everyday habits were the basis for the rhythmic nature of art forms throughout cultures and that one had to understand the psychophysical entirety of a community in order to understand the nature of its particular attitude toward rhythm. Boas shared Wundt's belief that modern people had lost the sense of rhythm that primitive culture displayed in its consecutive practices of the arts. Emotion was included in cultural expression but not in a solely determinist sense of traditional expression. Analysis revealed the heterogeneity of associations within pattern that Wundt had discussed and showed Boas that, in primitive culture, "the impressions of the outer world are associated intimately with subjective impressions, which they call forth regularly, but which are determined by the social surroundings of the individual."[128] The nature of these more elemental associations of similar combinatory heterogeneity would vary greatly depending on the culture and space, which encouraged the interrelation of all bodily movement patterns called for by both Wundt and Boas.

For both thinkers, particular patterns of artmaking signified immediate, plastic encapsulations of particular nervous formats and were one facet of socially shared values. Rhythm denoted culturally specific patterns of movement and connoted different trajectories of nervous development that house emotional qualities within culturally specific regularities of movement. This regularity of movement relied on socially instilled patterns of nervous reactions among a group that gave rise to elemental ideas that are indistinguishable from gestures:

> The relation between music, words, and dance are of a similar character. Primitive literary expression is often, though not by any means always, accompanied by some kind of motor activity; or certain kinds of motions may release articulations that take the form of song or spoken words. Strong, but controlled emotion finds utterance in movements of the body and in articulation, and emotional speech releases similar movements.[129]

Likewise, in *The Mind of Primitive Man*, Boas cited Wundt as the foremost theorist on the physiological basis of the social nature of habit, which is not surprising, given that its entire conceptual weight rests on the nature of nervous function and reaction outlined in the *Grundzüge*:

> The problem of the origin of elementary ideas has, however, been discussed from a psychological point of view; and the elaborate attempt by Wundt to work out a theory of folk psychology, as well as the studies of psychological sociologists, indicate lines of attack of the problem. To illustrate this point, I may mention the general discussion of the function of association in the beliefs of primitive people, given by Wundt. [130]

For Boas, pattern indicated habitual corporeal orientations in society, but these habits were never rote automations. The nature of these more elemental associations of similar combinatory heterogeneity would vary greatly, which encouraged the interrelation of all bodily movement patterns called for by Boas as a way to facilitate the understanding of a particular culture's nature as seen in the totality of its practices.

The differences between Durkheim and Boas illustrate the diverse ways in which Wundt's work found application in the broad field of the human sciences. The fact that

these two thinkers both worked outside of Germany is a testament to the international appeal of the psychologist's work, which only increased with the publication of the *Völkerpsychologie*. Readers found in this text a potent framework for understanding the individual's relation to society and the relationships between members of society. These topics mattered a great deal to art historians, who had begun to shift from previous interests in connoisseurship of individual artists to broader inquiries of cultural history, coupled with parallel reflections on the nature of aesthetics.

Anatomy and Empathy

"with the right hand finger of empathy – Dada in,
Dada out – but!! willi"

- Max Ernst, "Worringer, Profetor Dadaisticus," *Die Schammade*, April 1920[131]

From the mid-nineteenth century to the 1930s, the most concentrated use of Wundt's ideas in art history appeared in debates on empathy, the notion that the formal qualities of a work of art—be it painting, sculpture, ornament, music, or architecture—manifested a person's emotions to the extent that a viewer felt at one with internal rhythms of the object.[132] Scholars at this time used Wundt's work to establish physiological habit as the basis for the psychological pleasures associated to the constancy of aesthetic or empathetic experiences. As Gustav Jahoda has argued, in the

most general terms, the majority of these figures relied entirely on Wundt's systematic terminology distinguishing sensation (*Empfindung*), feeling (*Gefühl*), and affect (*Gemutsbewegung*).[133] This basic outlook was so prevalent in art history at the turn of the century that the word "empathy" (*Einfühlung*) did not necessarily have to appear in texts that treat the concept and use it as a fundamental support of a broader aesthetic theory.

In 1908, a young art historian named Wilhelm Worringer published a book titled *Abstraktion und Einfühlung*, which challenged the art historical assumption that empathy was an aesthetic standard with a decidedly hypothetical projection of how pre-modern civilizations developed art styles that met their emotional needs, which were often outside more conventional models of European aesthetic expectation. Young artists, art critics, poets, and philosophers of aesthetics leapt on the volume. Establishing Wundt's work in the intellectual context of Worringer's work allows one to perceive how the arguments in his book critiqued far more than the basic ideas of empathy and provided young artists with an intellectual source for constructing entirely alternative models of group action, creativity, and aesthetics in the sphere of cultural practice.

More than other scholars at this moment, Robert Vischer (1847-1933) and Heinrich Wölfflin (1864-1945) drew most considerably on Wundt's work in their theories of empathetic reception. Vischer's treatise *On the Optical Sense of Form* (1873) used Wundt's theories of vision and physiological habit formation from the psychologist's early text *Vorlesungen über die Menschen- und Thierseele* (1863) for his argument that habitually constituted structures in the eye give it a certain regularity of movement which provides the organic bases for "the rhythmic impression of form, which is nothing other than the pleasant overall sensation of a harmonic series of successful

self-motions."[134] Vischer's emphasis on the eye appears rather partial, but his inclusion of overall "self-motion" (*Selbstbewegung*) implicates the overall body and its nervous physiology as the basis for aesthetic feelings. As Vischer had it, a work of art with forms and colors that facilitated the habitual movements of the eye in the viewer's reception fostered the emotional effects of comfort within habitual bodily motion or practice. Engaging formal rhythm that reaffirmed pre-existent physiology also created an emotionally charged awareness of a deep correspondence between the individual and the work. Form became a veritable mirror for the motions of psychophysiological function.

Wölfflin was a close reader of Vischer's earlier work, though he took a different subject as the focus of his 1886 dissertation *Prolegomena to a Psychology of Architecture*, which focused on the nature of "the relation between bodily habit and favored proportions" as the basis of a culture's aesthetics of space.[135] Wölfflin built on Vischer's earlier correlation of aesthetic qualities of linear movement and habitual physiological structures in the eye by addressing the entirety of the moving body as it experienced emotional qualities of architectural space, according to an analogy between architectural qualities—symmetry, proportion, height, width, and vertical organization—and physiological properties of bodily symmetry and integrated function in the human body. He is unequivocal in his belief that "Our own bodily organization is the form through which we apprehend everything physical."[136] In order to support this claim, Wölfflin related the reader to the work of both Wundt and the early physiologist Rudolf Virchow (1821-1902) in order to describe the physiological and psychological consequences of how the body's various elements form its "unified community," in which many different parts interact in the functioning of the whole.[137] According to

Wolfflin, these elements operated in concert and gave the body its harmony, thus providing the physiological basis for the pleasure felt in an appreciation of interconnected spatial elements in architecture:

> Physical forms possess a character only because we ourselves possess a body. If we were purely visual beings, we would always be denied an aesthetic judgment of the physical world. But as human beings with a body that teaches us the nature of gravity, contraction, strength, and so on, we gather the experience that enables us to identify with the conditions of other forms.[138]

Qualities of form like symmetry or proportion were aesthetically pleasing, because one's own physiology has made him or her psychologically accustomed to these traits as harmonious form, due to the existence of analogical structures in one's own body. Feeling pleasure while walking through architectural spaces relied on the fact that the integration of various elements in the building were akin to the physiological integrations of the organs and organic faculties within a person's body.

In making this connection, Wölfflin's study extended Wundt's earlier notion of analogies of sensation, or a person's activity of connecting the emotional qualities of low notes and dark colors, based on the common between the sensory experiences. "Considered purely as sensations," the historian argued, "they would have nothing in common; yet they seem to be related by the equal gravity of their emotional tone."[139] Linear characteristics of architecture have the potential for a connection to these other sensations one may find in experiences of other art forms, so that a reception of painting or sculpture could help one in understanding the formal qualities of architecture, but Wölfflin was quick to indicate that these potential analogies of sensation could not

illuminate the *spatial* nature of architecture or its connected emotional phenomena. He sought to compose a theory of architectural reception that directly included bodily motion through space as a key element of the overall reception. His breakthrough was to posit that the basis of these analogies was not intrinsic to the objects perceived, but to the shared motions of nervous stimulation in the human body. Rather than posit analogical overlap in a space shared by two sensations, Wölfflin located this key meeting place in the human nervous system and its integration of functions in connection to habit and emotion.[140]

Wölfflin's topic of investigation and his use of physiology and physiological psychology likely received guidance and encouragement from his dissertation advisor Theodor Lipps (1851-1914), who was a physiological psychologist and philosopher of aesthetics. Lipps had published the first edition of his *Psychologische Studien* in 1885, the year before Wölfflin finished his dissertation. This text likely served as a major source of interest for Wölfflin during the composition of his own work, especially the long excursus on the perception of space, which drew on both Wundt and Ernst Mach, and an equally long essay on the differences between musical consonance and dissonance according to analogies of sensation that likely encouraged Wölfflin's use and subsequent complication of this concept in his study of architectural space.

In his *Psychologische Studien*, Lipps constructed analogies of sensation between different art forms for his arguments on the exact nature of consonance, which follows a lengthy discussion of Wundt's own theories on the topic. Lipps defined consonance like many other psychologists and philosophers at the time as a sequential continuity or affinity between two or more tonal masses or *Klangen*.[141] As Wundt had described in his

Grundzuge, noises and sounds were all sensations, which meant that both forms of stimulus entered the nervous system in the same way. The only difference between the two forms of sensation concerned the measurability of sound. Wundt distinguished constancy of tone from abruptness of noise. He argued that sounds are periodic movements of air which the auditory organ absorbs and transforms into regular or irregular excitatory movements that it sends to the cortex.[142] Periodic regularity of sound is the effect of an equal rest between vibrations, which gives a specific sound or tone a direct correspondence to vibratory regularity.[143] The diverse, relative intensities of these different frequencies yield tones of determined pitch that one discerns as persisting in a particular sensation. Making this base vibration a quality of utterance reboots the entire structure of expression and consciousness. Drawing out a vowel sound places this musical quality within language and alters the nature of utterance and its absorption by the speech centers as a specific sensation.[144]

Adding noise only increased the intensity of this interface between tissues and new vibrations. Wundt defined noise as a periodic irregularity that is more varied in duration and form. Noise was a specific sensation too, but it arose from an irregular vibration of air; meaning that it was either too abrupt, or that its duration was too discordant.[145] In all sensations of noise, simultaneous sensations are perceived indistinctly, due to the unique and discontinuous conditions of emergence that occur in diverse, jolting forms of short duration.[146] A great number of sounds contain noise, but noises are not considered part of the structure of vibratory regularity that constitutes proper timbre. One cannot deconstruct noise into simpler tones. It is the most elemental sonic phenomenon and the most infinitely varied. It can also trigger base reactive

movements, as when one flinches in surprise at a loud noise. Absorptive constancy of sound implied for a reader of Wundt that its stimuli fit within a prior structure of nerves and conduction paths. Describing the vibration of a sound as regular or irregular hinged on whether the nervous system transferred its stimuli as habitual or disjunctive. Aesthetics of tone relied on regular (habitual) vibrations that the nerves were used to absorbing. Intensities of noise were too abrupt or discordant for the compartmentalization of measurement.

Lipps built on Wundt's ideas by arguing that the psychologist treated consonance in too general terms, to the point that it was difficult for the reader to comprehend the essential reasons for why tonal affinity was aesthetically pleasing.[147] For Lipps, clarifying the aesthetic nature of consonance relied on distinguishing between extrinsic and intrinsic connections in *Klangen*. He felt that it was not enough to notice a common tone in two tonal masses and posit this similarity as the basis of aesthetic experience, for this commonality was only an extrinsic connection. In order to convey an *intrinsic* connection between tones, the common partial tone had to represent the essential nature of the two *Klangen*. This partial similarity was not merely formal, for it encapsulated a higher level of emotional quality within its particular sequence. Knowing this essential nature marked a fundamentally higher psychic experience than a simpler awareness of tonal sequence. Based on this distinction, Lipps connected an awareness of musical consonance to pleasures of continuity in other art forms like drawing and architecture. These analyses of sensation likely made his work an attractive intellectual source for Wölfflin.

Lipps took pains to explain how the aesthetic quality of consonance was not simply the result of noticing an empirical sequence. He used an analogy of sensation to

substantiate his tenet that awareness of fundamental unity in consonance necessitated a higher psychic level. Imagine, he told his reader, that one sees a single line passing through two separate drawings, as in two panels on an ornamental frieze. The line only achieves the phenomenon of intrinsic connection if "it has in it somehow, either in its form or in the manner in which it develops, something of the fundamental nature of the two drawings."[148] He used another analogy between the arts, this time of architecture, to emphasize the philosophical significance of the continuity. Lipps then asked his reader to imagine looking at pieces of Ionic columns scattered on the ground. According to the author, two separate modes of connecting took place in one's mind. First, seeing fragments of column reminds one that certain bases and volutes connect to a basic Ionic style. Second, a higher form of connecting in one's mind focuses on the ways in which these fragments show the "character of the Ionic style, especially the peculiar elasticity of movement that resides in it . . . I find in the two forms different embodiments of one and the same fundamental character or 'fundamental rhythm.'"[149] Perceiving this rhythm required that one connect bodily to the perceived regularities of movement as stylistically and emotionally pleasurable. As in music, the consonance of form had a certain rhythm or regularity of movement that a person connected to physiologically and psychologically, in the sense that the rhythm of the work and the viewer/listener drew on one another for emotive pungency. Seeing more of the same quality in an object gives one the "impression of unanimity" or a continuity of movement that increases the feeling of the form's "peculiar rhythm."[150] Perceiving a particular quality of rhythm or movement was a higher experience than noting a purely empirical similarity. It was the difference between noticing similarities and being aware that one was experiencing the

fundamental nature of a certain style as one connected to it with body and mind in a more visceral sense than pure empiricism.

For Lipps, empathy required harmonious interaction between the form of the work and the form of one's own psychophysiological structures. One had to isolate and focus on this peculiar quality and know, based on prior experience, that one was experiencing this quality. One had to use apperception—the mental faculty of isolation, fixation, and sequence. The faculty of apperception formed the basis of Lipps's theory of empathy in his *Psychologische Studien* and latter texts that Worringer cited specifically in his own critical study of the phenomenon.

In Worringer's critique of empathy, Lipps's usage of apperception as the keystone of empathetic engagement was a major point of critical inquiry. He focused most heavily on Lipps's argument that "the presupposition of the act of empathy is the general apperceptive activity."[151] Focusing of this kind led to an "objectified self-enjoyment," or the supposition that one's emotions were outside the subject and encapsulated in the form of an object, as though formal elements were a concretization of one's internal states. This interaction needed continuity to work and it thus hinged on the habitual use of apperception to expand upon a seen form until it has become fully encompassed by one's cognitive hardware and connected to habitual feeling.

The key element of apperception for Worringer is its feature of sequence or continuity in thought, coupled with the habitual nature of the act. Consequently, he argued, the aesthetic effect in empathy "can proceed only from that higher condition of matter which we call form and whose inner essence is regularity."[152] Continuously distinguishing an object in space provides a major contributing energy to the empathetic

engagement. Worringer was unequivocally critical of this mode of reception, which required "vigorous participation" and "habituation" which indicated the cultural partiality of this overall receptive mode.[153] Interaction of the sense organs according to practiced modes of bodily inquiry activated emotional qualities associated to formal and corporeal modes of continuity that are associated to sequences of practiced action. Thus, the perception of three-dimensionality in non-abstract art signals that this same psychosensory platform informed the making of the object and dictated its reception, so that "perception of three-dimensionality calls for a succession of perceptual elements that have to be combined," as in Lipps's example of the Ionic column.[154] Viewing a three-dimensional object in its continuity was more likely to foster an empathetic engagement based on the apperceptive fusing of discrete perceptual segments. In short, it was looking in the way that Modern Europeans were supposed to look at things.

Although he does not cite the *Völkerpsychologie*, Worringer's text abounds with its basic philosophies, so it is likely that the young historian drew on Wundt's work. At the very least, his ideas strongly paralleled arguments that the older psychologist had made in the years immediately preceding the publication of Worringer's text. Both thinkers argued that the foregrounding of apperception in an empathetic engagement was certainly partial to the modern European viewer. Other cultures used this technique of reception as well, but Wundt's work on myth and religion had established that the general use of empathy in these contexts—in particular in contexts of mythic personification of natural phenomena—indicated that empathy required a certain neurophysiological level of development that primitive or totemic cultures simply did not have. In his second installment of the *Völkerpsychologie*, which appeared in 1905, Wundt outlined the

relationship between mythic spiritual systems and modern usages of empathy. The age of myth, as described above, witnessed personifications of natural elements, like wind, the ocean, or dawn. As Wundt argued, this projection of human qualities onto these occurrences marked an ascendance from totemic culture, for one no longer relied on the animal kingdom for deities, meaning that empathy only occurred at a particular stage of psychological development in culture. It had little, if anything, to do with individual imaginative projection:

> Mythological personification is only an agitated degree of that which by analysis of aesthetic processes has designated as "empathy." Aesthetic empathy is nothing more than a reduced form of mythological personification, which is itself aesthetic empathy in its most extreme degree, in which the entire personality in its momentary understanding of consciousness, including earlier experience which goes into it, wanders over the object.[155]

Wundt also echoed Lipps in arguing that apperception guided this receptive mode in all cases.[156] But his relation of the concept to mythic religions suggests that modern interest in empathy is, in fact, a retrograde form of philosophical reflection that began in times of mythic consciousness. It had little to do with the immediate cultural moment of urban modernity, but it also was utterly absent from systems of perception and collective thought that appeared in earlier totemic or primitive cultures, which had made a great deal of the world's art.

Worringer wanted to think about art from non-European cultures in ways that did not necessarily rely on modern or mythic formulae of reception. In general terms, Worringer's awareness of *Völkerpsychologie* came from his friend the sociologist Georg

Simmel (1858-1918), with whom Worringer had contact as a student. In an introduction to a latter edition of his work, the historian told a picturesque story of his encounter with the great man in the deserted halls of the Trocadéro museum for non-Western art in Paris. Worringer wrote that listening to the elder intellectual speak about the artifacts in the museum "produced in a sudden, explosive act of birth the world of ideas which then found its way into my thesis."[157] The world of ideas to which Worringer referred was likely the tradition of *Völkerpsychologie*, with which Simmel had been involved since his own student days at Berlin University in 1876, when he took courses with Moritz Lazarus.[158] As mentioned above, Lazarus was a forerunner of these theories and Wundt had also studied with him for a time. But in contrast to Wundt's psychological history of cultures, Simmel preferred the sociological, rather than psychological outlook that Lazarus and his colleague Heymann Steinthal took in their work, and Simmel himself published several early articles in their journal.[159]

Whereas Wundt would attach his structure of individual psychology onto the collective subjectivity of a group as the basis of its social interaction, throughout the entirety of his work, Simmel focused more heavily on the interactions themselves and developed his theories of sociology based on the values associated to these practices. Individual human physiology had less of a focus in his work than did the gradual emergence of supra-individual phenomena out of interactions between people. During these early years of his career Simmel was friends with Paul Radestock, a psychologist who had taken his PhD with Wundt, and later began correspondence with Granville Stanley Hall (1844-1924), who received his PhD from William James and then went on to study with Wundt in Leipzig.[160] Although Simmel did not draw inspiration from

Wundt's ideas, he did draw from the general discourse of German *Völkerpsychologie* for many of his own sociological theories and certainly intended for his readers to consider his work on modern society in comparison to Wundt's.[161] Worringer, in turn, composed his own *Völkerpsychologie* by drawing on Simmel's earlier work that shared with Wundt an interest in cultural production as a group endeavor.

Worringer's use of the notion of the *Kunstwollen* formulated by the Austrian art historian Alois Riegl (1858-1905) instanced a foray into territory that was well within the boundaries of *Völkerpsychologie*. In using this concept of Riegl's, Worringer was able to argue for the partial nature of empathy as a barometer of artistic quality. As Riegl defined the term in his *Spatromische Kunstindustrie*, the *Kunstwollen* is a contextually specific social drive in a culture to create works displaying a communal experience and relies on a specific, shared physiological structure in the brain and nervous system that itself rests on the receptive modality of a historical stage in culture or a relatively smaller collective logic of a subgroup. Based on the fact that a *Kunstwollen* will never be the same from culture to culture, Worringer posits that, "What appears from our standpoint the greatest distortion must have been at the time, for its creator, the highest beauty and the fulfillment of his artistic vision."[162] The claim that each culture had its own model of aesthetic experience and formal quality had a basic anchor in the *Völkerpsychologie* and in the basic awareness Riegl had of Wundt's work.

As scholars have noted, Wundt's work was a major source for Riegl's theories.[163] This topic deserves more investigation, but one may outline the basic points of contact. Riegl's awareness of Wundt's work has received documentation, but little in depth study. In 1934, Julius von Schlosser was the first to associate Wundt's *Völkerpsychologie* to

Riegl's intellectual outlook.[164] Margaret Olin has gone deeper into Riegl's work and described how the historian drew on the ideas of philosopher Conrad Fiedler, who was a close and critical reader of Wundt, especially the psychologist's notion that expression develops from psychological processes, rather than illustrates psychological products.[165] As argued above, Riegl's fellow art historians like Vischer and Wölfflin also dealt with Wundt's work to varying degrees. In terms of theorizing collective creativity, one may consider Riegl's use of Wundt in relation to similar references in the scholarship of Aby Warburg (1866-1929), who attended the lectures of Karl Lamprecht (1856-1915), a professor of history at Leipzig who was one of Wundt's colleagues in debates concerning cultural psychology. Ernst Gombrich has written on how Warburg considered his work in relation to Wundt's theories of cultural psychology.[166] In addition to these institutional currents, Riegl also had access to popularized notions of Wundt's *Gesamtwille* that had entered the popular press around the 1890s, while the psychologist was writing his massive tomes. For example, in 1891, Wundt published an essay in the *Deutsche Rundschau*, a monthly journal of literature and human sciences, that outlined in clear language how his notion of collective will enabled a historian to study modes of artmaking in which the psychological processes of a collective outweighed the emotional needs of the individual.[167] These instances of connection provide the basis for a closer look at the way in which Riegl's well-known notion of the *Kunstwollen* overlaps with basic notions of Wundt's *Gesamtwille*.

Riegl's notion of the *Kunstwollen* is inherently Wundtian in its basic psychological premise that the most valid insights about shared thought patterns appear in cultural productions about which a culture appears to think the least, or those that it

makes most automatically. In a similar fashion, Riegl and Wundt were fascinated by the manner in which these seemingly automatic (intensely habitual) productions arise from customary movement patterns. While Wundt tried to synthesize all forms of cultural practice as manifesting a broad tenor of collective thought, Riegl was more focused than Wundt on comprehending the psychological nature of a culture or its relative developmental level solely through examining its visual art.

Worringer's interest in the relative nature of aesthetics has long been known, but scholars have generally omitted how Worringer implied the nature of neurophysiological relativism as the basis for cultural differences: the main tenet of the *Völkerpsychologie*. In addition to his basic tenet that "every spiritual attitude has its physical significance," one finds this reliance most clearly in the historian's stated reason of why a certain culture may lean toward a more abstract representational modality.[168] According to Worringer,

> Each individual people is naturally, in consequence of its innate structure, predisposed more toward the one or the other side, and the observation of whether the urge to abstraction or the urge to empathy prevails in its art provides us, at the same time, with an important psychological characterization.[169]

Worringer's reference to culturally specific aesthetics based on a shared, innate structure that made a person in a group predisposed toward certain psychological orientations was entirely within the realm of *Völkerpsychologie*, of which Wundt's was the most dominant in the moment. Worringer's focus on apperception as a partial standard of aesthetic quality likely drew on Wundt's belief that primitive cultures possessed only "traces" of this faculty. Worringer made empathy into an idea of individual experience in the reception of art that was anchored to a certain level of neurophysiological development.

Depending on context, these faculties will categorically differ with respect to the relative nature of habit, or the way in which one becomes cognizant of and responsive to exterior sensation. Thus the needs met by an object will not look or feel like empathy, because the needs are based on motives coming from bodies that had different wiring; that moved differently and therefore felt differently. For Worringer, Lipps had a good idea in relating apperception to aesthetics but he went counter to the physiologically relative notion of this faculty as outlined by Wundt and Riegl when he sought to apply it as a measure for aesthetic worth in an object made by any culture. Lipps simply overplayed his hand.

At least, that was what Worringer wanted his reader to think, but Lipps's original theory differed from Worringer's selective presentation of it as passive, which made it look far more like a mode of practice that unfolds without the active application of individual effort. For Lipps, empathy was just that: an activist venture, which meant that one deliberately utilized apperception in an engagement with the object. One built his/her experience. But in contrast to this theory, Worringer omitted the active dimension of Lipps's empathetic engagement, which gave the experience a far stronger dimension of habit and cultural inculcation, because he made it look like empathy happened automatically. The apparent lack of deliberateness involved in Worringer's selective quotations of Lipps serve the young historian's motive of making empathy look like a culturally relative form of practice, because any effortless action was, on the cultural level, far more particular to a certain space and time. Worringer represents a modern European viewer as one who understood empathy to be natural in the way that walking at a "walk" signal would be to a modern subject. In attaching this automatist functionality to

the experience, he made its mental operation look far more like a cultural habit of higher thought, which Wundt and Riegl had made more relative to a particular group experience.

Worringer followed this basic idea in stating that abstraction is the result of a developmental phase in which one was "not yet able to trust entirely to visual impression as a means of becoming familiar with a space extended before him, but was still dependent upon the assurances of his sense of touch."[170] As Wundt had argued in relation to his level of primitive culture, one's physiological comportment relied more heavily on the development of cognition through repeated touch. Touch was also a more conspicuous exemplar of alternative movement patterns. Tactility thus formed the figurehead of an entirely separate nervous orientation (not yet topicalized by his predecessor) and resultant psycho-cognitive makeup based on shared movement patterns in space. Fear of space is not a readymade, guiding force of cognition, but is built upon a base of alterior developmental and continually malleable nerves. In cultures where the nervous platform was elementary, only Riegl's notion of the "tactile nexus" was capable of "forming a whole for the imagination and of affording the spectator the tranquilizing consciousness of enjoying the object in the irrefragable necessity of its closed material individuality."[171] In primitive art, touch made a world that appeared confusing suddenly fall into order. A person in this culture could capture form in the modality of touch, but this potentiality has since been lost, due to a heavier emphasis on perception and abstract thought patterns.[172] In a hypothetical world that never fused, one had to remain at the level of closed, individual forms.

By attacking the apperceptive standard placed by Lipps on all aesthetic experience, Worringer was also addressing a particular context of aesthetic philosophy

that used models of normative thought from experimental psychology as the basis of its theories on perceiving quality in art. An informed reader would know that Lipps was closely associated to the act psychology of Oswald Külpe and the philosophy of Franz Brentano (1838-1917). He was knowingly picking a side in the debate between the Wundtian school of *Völkerpsychologie* and the Würzburg school of act psychology. The lines were clearly drawn within the institution. Külpe, the major exponent of act psychology, would leave Würzburg for Bonn in 1909. Lipps had taught there from 1877-1890 in the chair once occupied by Franz Brentano, who had argued earlier that mental phenomena were always unified, intentional, and distinct from physical phenomena, which Wundt would harshly criticize. Worringer aligned himself with the school of *Völkerpsychologie*, which was seeking to establish the culturally relative nature of the higher mental functions that Külpe was seeking to establish as standard, normative, and measurable. Wundt's notion that apperception could only be estimated in the laboratory, coupled with his belief that all higher mental functions required an analysis from the sphere of *Geisteswissenschaft*, gave the young historian a major anchor for his argument that one mode of apperception as exercised by a modern European viewer could never be the overarching standard for all cultural experience.

Worringer grasped the subtleties and revolutionary promise of what physiological psychology held for the analysis of diverse objects, and thus his theories of expression became very popular. Tactile relation to the world also had its own essences that the Modern West had lost.[173] His work showed that in contrast to the continuity of apperception and the sequential nature of modern aesthetic thought, primitive and abstract art had baser action patterns that were more like a need for activation, period. As

a *Kunstwollen*, it yields a subject position but is at base far less person-oriented than empathy and occurs in a communal energy of movement that lacked, *but did not seem to require*, continuity and expansiveness, both formally and in the feelings it offered to the modern subject. Bizarre looking art forms suggested a bodily form of otherness, down to the structure of the nervous system. In short, a form that does not foster empathy among a Modern viewer is not the fault of the object; it was made in accordance with different physiological movements from a nervous system that enabled an entirely different emotive platform. The physical, pre-cognitive nature of Worringer's terms for abstract artmaking never leaves the boundary of pure movement. Objects are "wrested" and "rendered" or shaped beyond perceptual recognition. If empathy implied a need for self-activation, then the *Kunstwollen* of primitive art was an impulse of collectivist activation. Amplifying the conditional and shared aspects of higher mental function allowed Worringer to scrutinize other modes of creation that show instances of alternative habituation and consciousness in a collective, rather than individual, level.

Scholars who focus on the interest that young artists had in Worringer's work generally omit that the young historian framed abstraction as a collective endeavor, rather than pre-existent, goal-oriented intellectual motivation in the minds of individual stylistic geniuses—that is, in terms that are generally used to describe the inventiveness of avant-garde art. Instead of focusing on individual invention as the basis of abstraction, Worringer's text suggested that the push to abstraction had to be a collective re-inculcation of base instinctive movements: "The first possibility was to accomplish this closed material individuality by the exclusion of the representation of space and by the exclusion of all subjective alteration."[174] Worringer's text implied that a new

Kunstwollen had to spring from a newly elementalized neurophysiological level in a group moving in new ways, groping for a new reality that it could not foresee, which was impossible for a habitually oriented modern individual, who had "become an individual and broken away from the mass. The dynamic force resting in an undifferentiated mass pressed together by a common instinct had alone been able to create from out of itself those forms of the highest abstract beauty. The individual on his own was too weak for such abstraction."[175] Worringer was specific about what abstract art needed to be: planar, tactile, and consisting of new movements.

Wundt's *Völkerpsychologie* inspired artists to figure out ways to inhabit this otherness in art through new movements as the vehicle for psychic change. Revolutionary users of Wundt's application of physiological theories to cultural studies cultivated a collision of elemental nervous change within cultural production in a manner that made culture a scene for mental mutation rather than reaffirmation. They redeployed these theories in a manner that fundamentally altered definitions of why art was significant in culture—art was now a process rather than a product. One could not change higher functions by changing higher functions, but by changing how one moved. The next chapter will consider these psychological and cultural concepts in the context of experimental dance and music pedagogy that involved calisthenics in work by figures with whom any avant-garde artists had extensive contact.

[1] Translating the term as "folk psychology" does not capture basic connotations of the German term, which can only be defined. "Folk psychology" connotes something for the modern reader like folk art and its charming naïveté, but a *Völkerpsychologie* could analyze the most ostensibly "civilized" cultures. I have left the German term, because translating the word into a more appropriate "psychology of peoples" is a bit bulky. An exception to the dearth of studies on the *VP* is *Robert Farr, The Roots of Modern Social Psychology,* (Oxford and Cambridge: Blackwell, 1996). Farr's study is the best tracing and comparative study of Wundt's *VP* and subsequent sociological theory, but this text, like all other texts that treat the *VP*, only discuss the basic theory of social interaction that the text offers, rather than establish any substantial correlation between this work and Wundt's lab practice. I shall undertake this correlation in the following chapters in which I discuss both lab practice and cultural theory in terms of variant forms of artistic practice. Other scholarly work on Wundt that mentions VP will also be cited at appropriate places.

[2] Wundt, *Völkerpsychologie. Eine Untersuchung der Entwicklungsgesetze von Sprache, Mythus und Sitte,* 10 vols. (Leipzig: Engelmann, 1900-1909). English summary in Wundt, *Elements of Folk Psychology: Outlines of a Psychological History of the Development of Mankind,* trans. Edward Leroy Schaub, (London: George Allen and Unwin and New New York: Macmillan, 1921), hereafter referred to as *Elements.* Wundt's own summary and general introduction to the project may be found in his article, "Ueber Ziele und Wege der Völkerpsychologie," *Philosophische Studien* 4 (1884): 1-27. Scholars generally overlook Wundt's interest in cultural studies, which was the necessary second half of his entire methodology. For example, Crary does not even list the text in his bibliography. They also overlook how he differed considerably from latter psychologists who picked up and applied Wundt's work in a more deeply positivist environment of experiment, especially in France. Wundt's work in the cultural sphere lent the objectivity of data to anthropological inquiry. See for example a discussion of the importance of the *Völkerpsychologie* in Alexander Goldenweiser, *Early Civilization: An Introduction to Anthropology* (New York: A.A. Knopf, 1922). I would like to thank Laura McGuire for alerting me to this text. Goldenweiser was a student of Boas.

[3] One could cite Freud's *Totem and Taboo* as an exception, but neither Freud nor Wundt would see these two texts in the same category, because Freud bases his archetypes on affective orientations primarily, and did so as a riposte to Wundt. In this text, as he did in other texts like the *Traumdeutung* (1900), Freud cites Wundt repeatedly only to refute him. As mentioned before, a scholarly work on Freud's overall use, abuse, and criticism of Wundtian ideas is sorely needed, given the consensus on his importance for the avant-garde all over the world.

[4] Woodruff Smith, *Politics and the Science of Culture in Germany, 1840-1920* (New York and Oxford: Oxford University Press, 1991), 124.

[5] Ibid.

[6] Wundt, *Elements*, 7.

[7] This readability likely explains why *Elemente* was translated.

[8] My summary of this history as it relates to Wundt is by necessity a partial one. Scholarly analyses of the broader debates between history, sociology, the natural sciences, and philosophy in which psychology figured is far broader and includes critical gestures by figures whose work falls outside the scope of this project. Selected studies of this broad topic are many, but the best overall studies that touch on all the major figures are Arens, *Structures of Knowing*, and Jahoda, *Crossroads Between Culture and Mind: Continuities and Change in Theories of Human Nature*, (Cambridge: Harvard University Press, 1993).

[9] At the outset, one must distinguish this notion of *Völk* consisting of mutable *practices* like language and custom from later discourses on *Völk* that connote race and a general social evolutionary stage. As Adrian Brock has brilliantly shown, the VP was actually a target of criticism during the upsurge of National Socialism during the 1930s. See "Was Wundt a 'Nazi'? *Theory and Psychology* 2 (1992): 205-223. His history of the reception of the VP in Germany encouraged my further investigation of Boas below.

[10] Wundt, *Elements*, 5

[11] This differentiation is different from the English sense of the word "culture," which can refer either to an entire group, or to the intellectual productions of that group. Germans at the turn of the century would likely have found these definitions confusing, for, as they might have it, the rhetorical effect of this imbrication is that it immediately connects certain practices to groups in a way that suffers a dearth of explanation in scientific terms.

[12] In a latter section of this chapter I shall make clear how Herder's basic notion undergoes a split in the twentieth century and is defined, respectively, in terms either of language and custom, or race and biology.

[13] The journal was *Zeitschrift für Völkerpsychologie und Sprachwissenschaft*, which ran from 1860-1890, then changed its name to *Zeitschrift des Vereins für Volkskunde*.

[14] Summary of Lazarus and Steinthal may be found in Gustav Jahoda, "Wilhelm Wundt's "*Völkerpsychologie*," in *A Pictorial History of Psychology*, ed. Bringmann et al (Carol Stream, IL: Quintessence Publishing, 1997), 148-150.

[15] Wundt, *Elements*, 3.

[16] Woodruff Smith, *Politics and the Sciences of Culture in Germany, 1840-1920* (Oxofrd and New York: Oxford University Press, 1991), 125.

[17] For example, Wundt argues, "Der praktisch bedeutsamste Beweis scheint mir freilich darin zu liegen, dass die Normen des Rechts nur aus einem realen Gesamtwillen jene verpflichende Kraft schopfen konnen, vermoge deren sie ihre unbedingte Herrschaft uber den Einzelwillen behaupten." Wundt, Uber das Verhaltnis des Einzelnen zur Gemeinschaft," Deutsche Rundschau, 1891, 203. I shall address this concept below in relation to the work of Alois Riegl.

[18] "The history of the development of the physical organism aims to understand not merely the genesis of the particular organs but primarily their cooperation and the correlation of their functions." Ibid, xiii. These structures form as variant modes of the base causality of nervous change and upward structuration that had appeared in the *Grundzüge*, but transferred to an arena of comparative *Kulturwissenschaft,* elemental physiological causality enabled the relativism of higher mental function. His translator for *Elements,* a condensed single volume of the multi-volume project, puts it plainly: "Wundt's *VP* is the result of a conviction that that there are certain mental phenomena which may not be interpreted satisfactorily by any psychology with restricts itself to the standpoint of individual consciousness. Fundamental to the conclusion of the present volume, therefore, is the assumption of the reality of collective minds." Edward Leroy Schaub, Introduction to Wundt, *Elements,* vii. Wundt's other works on logic and ethics played a role in his cultural studies as well, but the scope of my project prevents a fuller look at these ideas.

[19] One can draw on Marshall Sahlins's notion of specific evolution in order to better comprehend the manner in which Wundt understood adaptation in his Völkerpsychologie: "Adaptive specialization of populations is an inevitable aspect of life's evolution, and *advance* is a normal concomitant of adaptive specialization. In the context of specific evolution "advance" means that by adaptive modification the population is enabled to maintain or better itself in the face of a threat induced by changing environment or that it is enabled to exploit the same environment more effectively than before. In any case, in the specific perspective advance is characteristically *relative* – relative to the environmental circumstances." Marshall Sahlins, "Evolution: Specific and General," in *Evolution and Culture*, ed. Sahlins and Service, (Ann Arbor: University of Michigan Press, 1960), 14.

[20] Wundt, *Elements,* vii. Subsequent citations refer to this edition. Brevity prevents establishing deeper connections between Wundt and the burgeoning field of ethnography; my connections are basic and facilitate my studies of artmaking in later chapters. My approach here looks at theories of movement hatched in the *VP* and continued in later studies by figures like Durkheim and Boas,

alongside someone like Worringer. Riegl is discussed not in his own right but only as Worringer used specific aspects of his overall theories.

[21] Wundt, *Elements*, 12.

[22] Ibid, 9.

[23] This transcendence of "a more restricted folk circle" or concentrated and ultimately contrasting spiritual structure "constitutes one of the most significant events of mental history" (Ibid, 10). The appearances of these national religions – Wundt's examples are Christianity, Buddhism, and Islam – exemplify specific mental phenomena that parallel extensions of the state beyond the limits of the tribal unit. These activities set forth "reciprocal influences" between external practices such as economic life, custom, art, and science "give to human society its composite character" and indicate the appearance of what Wundt calls "cultural peoples" who in each case offer combinations of particularly national and universal human elements (Ibid).

[24] See for example, Hegel's dialectical vision of history in *Philosophy of History*, trans. J. Sibree (Amherst, NY: Prometheus Books, 1991).

[25] Berry, "Wundt's Völkerpsychologie and the Comparative Study of Human Behavior," in *Advances in Historiography of Psychology*, Eckardt and Sprung, eds., (Berlin: Deutscher Verlag der Wissenschaften, 1983), 96-97. Emphasis is Berry's.

[26] Ibid. Goldenweiser, as Berry correctly indicates, was another scholar who disputed the presumed evolutionary viewpoint of the *VP*. That view makes sense, because Goldenweiser studied under Boas, who used the *VP* to dispute the same idea. Local adaptability is an early version of what Marshall Sahlins would later call "specific evolution."

[27] Wundt, *Elements*, 12. Wundt's examples include Hobbes's Wildman and Rousseau's noble savage. These general structuring principles of emotional readings become modified with the general mood of a certain period. In relation to these ideals, any particular culture can evolve its world understanding that projects present values back into time. This sense of the present constituting a lens through which a past is understood is an active process of historical-cultural understanding within a group. If an ethnologist or other scientist uses structuring metaphors of this sort, then they will be guilty of the same misstep of presenting a particular cultural script as the necessary image of reality. It is thus intriguing and very ironic that the contemporaneous values of the lab and its authority, with all of its modern instruments, informed this particular insight, but it allowed Wundt to push for a more relativized vision of mental operation based on specific evolution.

[28] Wundt viewed these sources as presenting psychological facts, which in the post-colonial age is, of course, problematic, because ethnographic study creates a representation of cultural otherness that corresponds to expectations of it among Western readers.

[29] Kurt Danziger, "Origins and Basic Principles of Wundt's *Völkerpsychologie*," *British Journal of Social Psychology* 22 (1983): 308-309.

[30] I use the term "subgroups" or "subcollectives" in order to emphasize how any study of shared cultural values in the VP addressed a segment of the world population, and never cast any collective idea as a standard that all other cultures worked to meet.

[31] The initiator of this view was Auguste Comte (1798-1857), the French philosopher and sociologist, whose work was also a major source for Durkheim. See his *General View of Positivism*, trans. J.H. Bridges (Cambridge University Press, 2009) and Mary Pickering, *Auguste Comte: An Intellectual Biography* (Cambridge and New York: Cambridge University Press, 1993).

[32] See, for example, Wundt, "Über Ausfrage experimente und über die Methoden zur Psychologie des Denkens," *Psychologische Studien* 3 (1907): 301-360. Wundt believed that trying to understand one's means of comprehension by using that structure was inherently tautological. Objectivity relied on separateness and one could never be outside one's own thought. This position was unpopular in the age of positivism. For more on the differences between Wundt and the circle which rose around Külpe, see Kurt Danziger, "The Positivist Repudiation of Wundt," *Journal of the History of the Behavioral Sciences* 15 (1979): 205-230, Mitchell G. Ash, "Wilhelm Wundt and Oswald Külpe on the Institutional Status of Psychology: An Academic Controversy in Historical Context," in *Wundt Studies*, ed. Bringmann and Tweney (Toronto: C.J. Hogrefe, 1980): 396-421. For a basic description of Külpe and the foundations of act psychology see Katherine Arens, *Structures of Knowing: Psychologies of the Nineteenth Century*, (Dordrecht, Boston, and London: Kluwer Academic, 1989), 27-30 and Danziger, *Constructing the Subject*, 34-48. These positivist methods of diagnosis placed its inquiries outside or above culture. France and Britain soon followed suit.

[33] Panofsky, "Iconography and Iconology: An Introduction to the Study of Renaissance Art (1939)," *Meaning in the Visual Arts*, (Chicago: University of Chicago Press, 1982), 40-41.

[34] Panofsky always said that his system did not really work for Modern art and it is likely because he knew that this dimension of artmaking grew out of a response to Wundt's *VP* , in which an altering of movement systems below a level of higher intellectual modes diverted communicative gesture from a sphere of immediate recognition and iconological reinforcement. It is likely that

Panofsky knew full well what he was doing, and what he was omitting. He was working within a humanist orientation, but certainly recognized that there could be other orientations. On Wundt's side, the historical side of the *Völkerpsychologie* indicates its genetic nature -- how it is the study not only of mental *being* but also of *becoming*. Thus it is critical to know the group's history, as it transitions from well-defined primitive conditions in a continuous series of stages to higher civilizations.

[35] Panofsky likely knew it, given his chosen focus on art that encapsulates the concepts of Western humanism, coupled with his extensive connections to the intellectual culture of his day. However, even his focus on the visual arts as an ascendant property of the rest of human culture would look too one-sided to a Wundtian, who would prefer a synthesis of all cultural forms as indicating alternative nervous energies as the basis for a certain frequency of collective consciousness. It is truly intriguing that Panofsky likely knew the basics of this theory well before the 1930s, because he studied philology at university during a time that overlapped almost exactly with the publication of Wundt's first volumes of *Völkerpsychologie* which were dedicated to language and that sent a shockwave through the humanities. Specifically, during his time at the University of Berlin from 1910-1914. See Michael Ann Holly, *Panofsky and the Foundations of Art History* (Ithaca: Cornell University Press, 1984).

[36] "Mit dem gleichen Rechte also, mit dem man behauptet, Tanz und Rhythmus und mit ihnen die Anfänge der Musik oder der Poesie seien fruher als die der bildenden Kunst, könnte man annehmen, die verschiedenen Sinne des Menschen entwickelten sich nicht gleichzeitig, sondern nacheinander." Wundt, *Völkerpsychologie*, vol. 3, *Die Kunst*, (Leipzig: Verlag von Wilhelm Engelmann, 1908), 104.

[37] "Dort nimmt man an, daß Lust und Schmerz die Lebensreise seien, die den Menschen zuerst zu ausdrucksvollen Lauten und dann, indem der Gedanke sich zum Laut gesellte, zum lyrischen Erguss seiner Gefühle geführt haben." Wundt, *Völkerpsychologie*, vol. 3, *Die Kunst*, (Leipzig: Verlag von Wilhelm Engelmann, 1908), 324.

[38] Ibid, xv. Durkheim in particular differed from Wundt concerning the place of judgment, as we will see below.

[39] Ibid. *Kulturwissenschaft* was truly that; it did not simply act like a science. *It was science*, because it based its findings on physiological psychology. Decades later, Anglo academics like C.P. Snow presented the "two cultures" debate as something that had accidentally unfolded as the accidental and unfortunate legacy of classical disciplinary divisions within academia, but Snow left out this substantial moment when the two fields were running on the same channel.[39]

Ethnology claimed to do a similar thing, and it makes sense that Wundt posits reciprocity between it and his field of *VP* . In Snow's time, the impact of National Socialism had caused the watering down of these theories into behaviorism in England and the US, but before and even during the rise of Hitler, manifold versions of these basic theories were entirely prominent all over Europe. Culture was physiological before it was affective. Wundt's students like E.R. Jaensch and Friedrich Kiesow are generally attributed with developing the racial psychologies that informed the guided genocides of non-Aryan peoples, but Wundt's *VP* is not selective in its descriptions of racial inferiority. He looks at primitivism as a general level of relative psychological development, to which he associates different cultures from all over the world. While today this action is reprehensibly ethnocentric, it is a far cry from the better-known developments of the "Jewish mentality" and its resulting horrific experiments in the National Socialist state. Wundt's project is less simplistically unilateral; it is a more general application of physiological psychology to the development of world civilization. In more radical circles, it informed the soft sociology of the pre-cybernetic global village before the hardcore eugenic cleansing by the Nazi *Volk*. His cultural psychology depended more on the specific nexuses of psychological schemas of nerves, time period, materials, and region than on race, because it is based on patterns of historically relative spatio-temporal experience and the gradual buildup of practices out of nervous habit. If anything, it presents humanity as a more unified organic entity, in which difference is simply the result of different wiring in the physiological nervous system. While clearly problematic, this factor clearly makes the proposed return to nature in the cultures of the *Wandervogel* or the embrace of primitivist aesthetics by avant-garde circles entirely more possible in a radically new fashion, because one changes style by changing physical movement, which consequently alters nerves and changes how one views time, materials (relationships of objects), and space.

[40] Wundt, *Elements*, 15.

[41] Ibid, 17.

[42] Ibid.

[43] Ibid, 113.

[44] The details of how mental states correlate with historical eras are critical to defining this program. Wundt does not need history to understand the psychological nature of primitive culture. The art of caves looks too much like the primitive art of today to yield unique properties of an earlier period. Measurements of the brain cavity or other anatomical data about prehistoric man "can give us no information concerning the psychological aspect of the question regarding

the nature of primitive man" (Wundt, *Elements*, 15). It is thus largely misguided to think that prehistoric primitive cultures are psychologically lower than present-day primitive cultures.

[45] Wundt, *Elements*, pp. 20-21.

[46] Wundt, *Elements*, 73. I shall have more to say about this particular belief throughout this chapter.

[47] Discussed most clearly in Wundt, *Principles*, Tichtener trans., 25-216.

[48] Wundt, *Elements*, 28.

[49] Ibid, 33.

[50] Ibid.

[51] Ibid.

[52] Ibid. For example, the bow and arrow began when "the man of nature, pressing his way through the dense underbrush of the forest and experiencing in person the hard blows of branches that he has bent back, gains a lively impression of the elastic power of bent wood" (Ibid, 28). The simple movement of the body through the space of the forest gives rise to a chance discovery of effects as qualities that one experiences repeatedly by walking through dense underbrush. Attention and sequential cognizance begin to develop, for "the attention is forced to the observation that this effect increases when the wood is bent out of its natural shape" (Ibid). Getting slapped in the face with a branch literally knocks sense into the primitive man, especially those in Asia and the Asiatic Islands, who first constructed the reflexive bow in which the curve is contrary to the natural curve of the wood.

[53] Ibid, 29.

[54] Ibid.

[55] Ibid.

[56] Ibid.

[57] Ibid, 30. Connecting observed qualities from one experience to another according to a shared resultant effect had mystical overtones

[58] For example, if a primitive is walking through the jungle after a rainstorm and happens upon coconut halves filled with water, then the formation of paths from the continued response to these observations will enable application of practice in the acquisition of these coconuts as vessels. Caves, then, also give rise to society (Ibid, 50). More extensive social groups occur when families withdraw into caves. Space matters more than some sort of human bond at this initial stage. Wundt describes how "the larger caves are frequently occupied in common by a large number of families . . . yet the groups of co-dwellers are not so much determined by

considerations of kinship as by the size of places of refuge" (Ibid). Spatial facilitation of this congruence of families within caves encourages formations into social groups. Gradually different clans take hold of property that is customarily understood as communal, whether it is hunting grounds or fields. These rudimentary forms of social organization "arise through the free association of individuals" and thus may freely dissolve. Ibid, 51. In these early forms of social organization, a chosen leader stays in power only for the duration of a communal undertaking like a hunt or expedition. The temporary leader willingly surrenders dominance at the end of the group quest. At this rudimentary level of society, no permanent chiefs exist. The similarity between this state of affairs and basic anarchist rule in communes from this same time is very close.

[59] But encapsulating qualities of a bird's movement differed from using a coconut as a bowl, and the difference spotlights the diverse means by which primitives experience the natural world. In this case of the arrow, the primitive copies a quality of movement; in the case of the coconut or boomerang it was a chance discovery of function. Mechanics do not matter in either case, so the primitive use of the natural world is outside the spectrum of Kantian science, in which mechanics and mechanical functions were the most perfect scientific form. Instead, these chance discoveries and associations of objects based on resultant effect that occur at the most rudimentary stages of mental history indicate an absorptive mechanics of analogies between resultant effects that is devoid of apperceptive forethought. It was a revelation. For example, "Man did not invent the art of kindling fire; it would be nearer the truth to say that he found it, inasmuch as he discovered it while making his utensils" (Ibid). Like the boomerang that was found by chance, fire was the accidental result of friction made by rubbing wood. After its accidental discovery, "it became possible to kindle it at will, and this developed into a skillful act" (Ibid, 31). New paths were made in the nervous system that enabled the creation of this fire to be fashioned into habitual practice.

[60] Farr, op cit, 41, has made this crucial point.

[61] Farr, Ibid. Saussure received his PhD in philology at the University of Leipzig, where Wundt taught psychology. See Jonathan Culler, *Saussure* (Glasgow: Fontana Collins, 1976).

[62] This omission of Wundtian language theory has many causes, but in art history, the main culprit is the carryover of Saussure's theories into French structuralism, which then became a crucial methodological tool for academics in the 1960s and afterwards who sought to think outside the neo-Kantian structures of formalism. These were bold moves to be sure, but far too one-sided.

[63] Wundt, *Elements*, 31.

[64] "Der Laut wurde nicht gebildet, weil er eine bestimmte Ähnlichkeit mit dem objectiven Eindruck besaß, sondern er wurde umgekehrt dem Eindruck ähnlich, weil die Artikulationsbewegung, aus der er hervorging, dies notwendig so mit sich führte." Wundt, *Völkerpsychologie*; *die Sprache*, vol. 1 pt. 1, 343.

[65] "Hierdurch warden wir auf das hingewiesen, was den Laut selber erst erzeugt: auf die Lautbewegung der Sprachorgane. Unmittelbarsind es ja nicht die Laute, sondern die Lautbewegungen, die durch den äußeren Eindruck triebartig ausgelöst werden." Wundt, *Völkerpsychologie*; *die Sprache*, vol. 1 pt. 1, 343.

[66] "Hier bieten aber offenbar alle Arten sogennanter 'Lachnachahmung' den den ausgezeichneten Fall dar, dass die Artikulation der Sprachorgane eine äußere Bewegung oder die Wirkung einrer solchen, die noch deutlich den Bewegungsmodus erkennen läßt, nachbildet." Wundt, *Völkerpsychologie*; *die Sprache*, vol. 1 pt. 1, 343.

[67] Nach diesem Zusammenhange mit den sonstigen Gebärden können wir eine solche nachahmende oder nachbildende Bewegung der Artikulationsorgane am zutreffendsten al seine Lautgebärde bezeichnen." Ibid, 343.

[68] "Dass dies willkürlich geschehe, ist wiederum durch die nature der ursprünglichen Triebbewegung ausgeschlossen." Ibid, 343

[69] "Wie vielmehr jeder Lebhaft erregte Beobachter einen Bewegungsvorgang, den er sieht, mit Meinen und Gebarden begleitet, so und nicht anders haben wir uns jene Lautbewegungen zu denken: als Bewegungen, die, indem sie die durch den Eindruck erregten subjektiven Gefühle ausdrucken, unwillkürlich auch den das Gefühl erregenden Vorgang selbst nachbilden." Ibid, 343.

[70] That is, based on what he had found in the other sensory centers, which were nodal association centers, despite their ordinary interpretation as central projection surfaces. Wundt, Principles of Physiological Psychology, Titchener trans, 315.

[71] These manifold relations between the various speech centers were responsible for ideational and affective "meaning contents," but this content arose from nerves stimulated in experience and are not merely imminent or archetypal ideas. Wundt, Grundzuge, 306.

[72] Wundt, *Elements*, 53.

[73] Wundt thought that one saw this carryover most readily in elemental linguistic constructs like mimicry of heard sounds (*Lachnachahmung*) and base forms of sound gesture. The majority of the most primitive languages have been lost, yet there is no doubt that they contain within them

the potential of mind to indicate experience. The most primitive tribes largely remain secluded, but their language still displays dominant characteristics of more advanced neighboring cultures, which was the result of earlier syncretism, in which a competition of languages ended with the more dominant language determining vocabulary and grammar, while the more primitive version determined pronunciation. One may read between the lines of this argument with reference to Wundt's physiological psychology, for Wundt's claim suggests that pronunciation is slower to change because it requires more physiological (read: nervous) alterations within the body, in contrast to manipulations in the nervous system by changes in the conceptual nature of grammatical structure. The brain changes more quickly than the tongue. One is a system of nerves, the other is pure muscle that nerves move but cannot shape as quickly as paths in the centers. Regardless of which cultural level decides what characteristic, Wundt feels that the most primitive spoken languages have long since vanished from the earth. One may still grasp considerable traces of these languages. Wundt argued that African languages in the Sudan or Togo were among the most primitive, especially in properties that exist within but also in addition to structures of spoken language, which is only one form of communication. Specifically the language of Ewe in present-day Southeast Ghana, called Togoland in the period when the territory was a colony of Germany. After WWI the territory was split between France and England. See Benjamin Lawrence, *Locality, Mobility, and "Nation": Periurban Colonialism in Togo's Eweland, 1900-1960* (Rochester: University of Rochester Press, 2007).

[74] Wundt, *Elements*, 58.

[75] Ibid, 58-59.

[76] Ibid, 60. Ibid. One finds this property in mimetic movements of the face, which communicate emotions and ideas. When ideas "strongly tinged with feeling" enter the course of emotion, direct mimetic expressions of the face receive supplementary movement from the arms and hands. For example, in an "ideational process of an emotional nature," one may make gestures of attack (striking the palm), or point to objects to which the ideas refer, "though there may be no indication of communicating the ideas" (Ibid, 60-61).

[77] Ibid, 61.

[78] Ibid, 64.

[79] The clearest example of direct representation occurs when the object is present and one can point to it. If in a language of gestures the object is absent, one must employ "graphic" gestures that "represent an absent object by pictures outlined in the air" (Ibid, 62). For example, the gesture language for "house" includes outlining the walls and roof in the air. Sometimes, a whole

series of distinct gestures are required. Pointing and graphic gestures ultimately comprise the two elements of gesture language. Ibid, 63. Within graphic gestures, a sub-group of significant gestures are representative of incidental characteristics, as when one expresses the word “man” by lifting the hat. These signs are all directly perceptible. The most important characteristic of gesture language is the total absence of abstract concepts. Only perceptual representations exist in this form of communication. Some representations express concepts that have acquired symbolical meaning as expressions of non-perceptual concepts. For example, the Dakota culture expresses the word “truth” by moving the index finger directly forward from the lips, and express dishonesty by moving the finger to the right or left. But these symbolical signs are rare “if the natural gesture language has not been artificially reconstructed” outside of perceptual reference, as one finds in the more primitive forms of gesture language that arise in more rudimentary mental environments. Nevertheless, these symbolic gestures always retain marked perceptual characteristics.

[80] Ibid.

[81] Ibid.

[82] Ibid.

[83] Ibid, 72.

[84] Ibid, 73.

[85] Ibid.

[86] Ibid.

[87] Ibid.

[88] Ibid, 70.

[89] Ibid, 71.

[90] Ibid, 68-69.

[91] Ibid, 69. Agglomeration is the gathering of elements into a single mass, while agglutination is the formation of a mass in which one can still distinguish distinct pieces.

[92] Ibid, 70. Wundt is referring here to the Ewe language.

[93] Ibid, 71.

[94] Ibid.

[95] Ibid.

[96] Ibid.

[97] Der nahe Zusammenhang der Ausdrucksbewegungen mit der Sprache, wie e runs augenfallig in der Gebardensprache begegnet ist, wiederholt sich gewissermassen auf einer hoheren Stufe in der

engen Verbindung, welche die zur Kunst erhobene Form der Ausdrucksbewegungen, der Tanz, mit der ursprunglichsten rhythmischen Kunstform der Sprache, mit dem Lied, eingeht. Wo immer wir beide bis zu einem Punkte zuruckverfolgen konnen, der ihnen Anfangen naheliegt, da pflegen sich zur rhythmisch bewegten Sprache des Liedes auch rhythmische Korperbewegungen zu gesellen, als ein naturlicher Ausdruck der gleichen Stimmungen und Gefuhle." Wundt, *Völkerpsychologie*, vol. 3, *die Kunst*, 419.

[98] Hier geht man davon aus, dass das wesentliche Element, dasjenige zugleich, das Poesie und Musik verbinde, der Rhythmus sei: dieser aber finde seinen reinsten und darum ursprunglichen Ausdruck im Tanz . . . Und dass der Tanz die sinnenfalligste Form der den musischen Kunsten gemeinsamen rhythmischen Bewegung ist, auf sein Vorausgehen in der Zeit zu schliessen." Wundt, *Völkerpsychologie*, vol. 3, 324.

[99] "Namentlich sind die Motiv alter Tanzsitten selbst bie manchen Naturvölkern nicht selten vergessen worden, und Tänze, die ihrem ganzen Charakter nach die Herkunft aus einstigen Kulturzeremonien verraten, sind ganz oder teilweise zu bloßen gymnastischen Spielen geworden." Wundt, *Völkerpsychologie* vol. 3, 421.

[100] Ibid, 75. "Mystical" is not mythological. Wundt argued that the anthropomorphicization of natural phenomena did not occur in primitive cultures and was a feature of mythological cultures, like Greece and Rome.

[101] Ibid, 94.

[102] *Elements*, 94.

[103] "Noch in dieser rückläufigen Entwicklung erscheint aber der Tanz des Naturmenschen in der von allen Zuschauern gerühmten malerischen Gymnsatik der Körperbewegungen und in der bewunderswerten Präzision, mit der oft sehr verwickelte Figuren ausgeführt werden, schon darum al seine einzigartige Kunstform, weil ihr Höhepunkt einer Stufe der Kultur angehört, auf der alle andern Künste noch nicht über ihre dürftigsten Anfänge hinausgekommen sind." Wundt, *Völkerpsychologie* vol. 3, 421.

[104] *Elements*, 94. Poetic forms of speech appear in the repeated refrain. Wundt cites this song about a lemur or "*kra*" by the Semang culture of the Malay Peninsula in Southeast Asia to exemplify the repeated refrain:

> He runs along the branches, the *kra*,
> He carries the fruit with him, the *kra*,
> He runs to and fro, the *kra*;
> Over living bamboo, the *kra*,

Over the dead bamboo, the *kra* (Ibid).

These simple descriptions of seeing a lemur resemble the concrete nature of language, which moves along image by image. Repeating the word "*kra*" makes the song musical by giving it a coherent pattern that draws a relation between each different observational statement (Ibid, 97).

[105] Ibid.

[106] This relationship between different rhythms of dance gesture and sound gesture varied according to context. Modern dance (in this context, a form like classical ballet) utilized instruments that took over for the expressive instrument of the voice and, in Wundt's opinion, "suppress the natural expression of emotions" (Ibid). This "natural" expression was bodily, either in vocal form or movement of limbs. Wundt believed that the only place that the emotions received active vocal expressions in Western culture were the folk dances in villages across Europe (Ibid). Primitive dance rhythm and the gestures made in its performance figure immediately into the formal nature of art.

[107] Ibid, 100.

[108] Ibid, 100-101.

[109] Ibid.

[110] Ibid.

[111] Ibid, 102-103.

[112] Ibid, 103.

[113] Ibid, 103-104.

[114] Ibid, 103

[115] Historian of psychology Robert M. Farr has shown that pillars of first generation ethnology, sociology, and anthropology, including Bronislaw Malinowski (1884-1942), Franz Boas (1858-1942), W.I. Thomas (1863-1947), Émile Durkheim (1858-1917), and G.H. Mead (1863-1931) all visited Leipzig for varying lengths of time. This is not, of course, to claim these thinkers as entirely Wundtian; each one had a separate theory of mind that was often rather divergent from Wundt's and more dependent on particular intellectual contexts. Robert M. Farr, "The Impact of Wundt on the Development of Social Psychoogy: A Critical Re-Appraisal," in *Advances in Historiography of Psychology*, Eckardt and Sprung, eds., (Berlin, Deutscher Verlag der Wissenschaften, 1983), 86. For Malinowski, see Michael Young, *Malinowski: Odyssey of an Anthropologist, 1884-1920*, (New Haven: Yale University Press, 2004); for Boas, see *Volksgeist as Method and Ethic: Essays on Boasian Ethnology and German Anthropology*, ed. George Stocking, (Madison: University of Wisconsin Press, 1996), and Douglas Cole, *Franz Boas: The*

Early Years, 1859-1906, (Vancouver: Douglas and McIntyre and Seattle: University of Washington Press, 1999); for Thomas, see Lewis Coser, *Masters of Sociological Thought*, (New York: Harcourt, Brace, and Jovanovich, 1977); for Durkheim, see Steven Lukes, *Emile Durkheim: His Life and Work; A Historical and Critical Study*, (Harmondsworth: Penguin, 1975); for Mead, see David Miller, *G.H. Mead: Self, Language, and the World*, (Austin: University of Texas Press, 1973).

[116] Durkheim's two-part essay on Wundt's lab is "La philosophie dans les Universités allemands," Revue Internationale de l'Enseignement 7 (April 15, 1887): 313-338 and (May 15, 1887): 423-440.

[117] Wundt, "Über Ziele und Wege der Völkerpsychologie," *Philosophische Studien* 4 (1884): 1-27. Durkheim, "Représentations individuelles et représentations collectives," *Revue de Metaphysique et de Morale* 6 (1898): 273-302.

[118] Emile Durkheim, *Elementary Forms of Religious Life*, trans. Karen E. Fields, (New York and London: Free Press, 1995), 349. "Intensity" is Wundt's term for the relative strength of a psychic or nervous charge. I shall have more to say about this term in the chapter on Dada.

[119] Durkheim, *Elementary Forms*, 436.

[120] For example: "Even the life of primitive peoples of nature is not entirely unaffected by individual personalities, whose influence may be more or less permanently operative even after they themselves have been forgotten . . . inasmuch as every particular volition is conditioned by motives inherent in the general constitution of individual consciousness, it is subject to the same psychical causality that dominates human consciousness in general." Wundt, *Elements*, 514. Thus new collectivities can build their own version of psychic operation and variation on the socius. Wundt's version of individual and collective is far more reciprocal.

[121] Wundt tended toward this direction in the *VP* when he wrote that the psychology of language can inform a study of art "from its beginnings among primitive races down to its early manifestations among cultural peoples, at which point its description is taken up by the history of art" (Ibid).

[122] See Le Bon, *La Psychologie des foules* (1895), trans. as *The Crowd: A Study of the Popular Mind*, (New York: Viking, 1960). Standard sources on Le Bon include Nye, *The Origins of Crowd Psychology: Gustave Le Bon and the Crisis of Mass Democracy in the Third Republic*, (London and Beverly Hills: Sage Publications, 1975); *Crime, Madness, and Politics in Modern France: The Medical Concept of National Decline*, (Princeton University Press, 1984).

[123] Boas, *Primitive Art* (1927), (New York: Dover, 1955), 10. Subsequent citations refer to this edition.

[124] Ibid, 33.

[125] Ibid, 197. German translation as *Kultur und Rasse* (Leipzig: Veit., 1914). See Brock for the reception of this text in pre-WWII Germany.

[126] Ibid, 211.

[127] Ibid, 218.

[128] Ibid, 238.

[129] Ibid, 303.

[130] Boas, *The Mind of Primitive Man: A Course of Lectures Delivered Before the Lowell Institute, Boston, and the National University of Mexico, 1910-1911*, (New York: Macmillan Company, 1911), 173.

[131] Reprinted and trans. in Ades, ed, *The Dada Reader*, (Chicago: University of Chicago Press, 2003), 241.

[132] In their compilation Empathy, Form, and Space: Problems in German Aesthetics, 1873-1893 (Santa Monica: Getty Center for the History of Art and the Humanities, 1994), Harry Malgrave and Eleftherios Ikonomou argue that "Wundt's lectures supplied artists and aestheticians with concise and readable textbooks on the workings of the human body and mind" (15). In the essays collected, the editors establish their claim that Wundt's terminology "established the conceptual framework for much of the discussion of the last decades of the century" (15).

[133] Gustav Jahoda, "Theodor Lipps and the Shift from 'Sympathy' to 'Empathy,'" *Journal of the History of the Behavioral Sciences* 41 (Spring 2005): 151-163, esp. 153.

[134] Robert Vischer, On the Optical Sense of Form (1873), in Mallgrave and Ikonomou, Ibid, 97. This earlier work on psychology by Wundt was translated into English in 1894 and went through four editions by 1907. For more on this text and Wundt's other early works see Claudia Wassmann, "Physiological Optics, Cognition, and Emotion: A Novel Look at the Early Work of Wilhelm Wundt," *Journal of the History of Medicine and Allied Sciences* 64 (April 2009): 213-249.

[135] Wölfflin, *Prolegomena to a History of Architecture* (1886), in Malgrave and Ikonomou, eds., 171. Wölfflin is best known by art historians today for his *Principles of Art History* (*Kunstgeschichtliche Grundbegriffe*, 1915), in which he argued that appreciating linear or painterly qualities of artistic style can allow one to distinguish different national or regional characteristics of artistic creativity.

[136] Wolfflin, Prolegomena, 157-158.

[137] Wölfflin , Prolegomena, Ibid, 165-166. For more on Virchow see Erwin Ackerknecht, *Rudolf Virchow: Doctor, Statesman, Anthropologist* (Madison: University of Wisconsin Press, 1953).

[138] Wölfflin , *Prolegomena*, 151.

[139] Wölfflin , *Prolegomena*, 158.

[140] After establishing Wundt's physiological psychology as the basis of his theory of architectural experience, Wölfflin extended this basic theory into a more hypothetical historical model of stylistic diversity, but his case studies are rather heavy-handed. For example, he saw a crucial relationship between the slenderness of the figures in Persian miniatures (seen as literal representations) and the modest girth of minarets.

[141] In passing over theories that mention *Klang*, one cannot help but think of Kandinsky's interest in this term, but one should remember that is was a common term for a tonal mass, and more writers used it than only Lipps and Wundt.

[142] Wundt, *Éléments de psychologie physiologique*, trans. Rouvier, vol. 2, 437.

[143] Closeness of several sounds that resound simultaneously creates a more complex sound Each sound is a composite of simple tones. In this composite, the fundamental tone has the most energy and determines the pitch of the tone (Ibid, 441). Some harmonic or weaker tones within the complex sound also correspond to a given number of vibrations.

[144] Ibid.

[145] Ibid, 438.

[146] Ibid, 442.

[147] Wundt's discussion of consonance and dissonance appears in chapter 12 of many different editions of his Grundzuge.

[148] Theodor Lipps, "The Nature of Musical Consonance and Dissonance," in *Psychological Studies*, 2nd ed. (1905), trans. Herbert C. Sanborn (Baltimore: The Williams and Wilkins Company, 1926), 215.

[149] Lipps, Ibid, 219-220.

[150] Ibid.

[151] Lipps, *Aesthetik* (1907), quoted by Worringer, op cit, 5.

[152] Wilhelm Worringer, *Abstraction and Empathy*, 32.

[153] Ibid.

[154] Ibid, 21.

[155] "So ist die mythologische Personifikation nur ein gesteigerter Grad aller jener Vorgänge, die man bei der Analyse der ästhetischen Wirkungen als 'Einfühlung' bezeichnet hat. Die ästhetische Einfühlung ist nichts anderes als eine ermäßigte Form mythologischen Personifikation, und diese selbst ist die asthetische Einfühlung in jenem äussersten Grade, wo die ganze Personlichkeit in ihrem momentanen Bewußtseinzustand samt den Nachwirkungen früherer Erlebnisse, die in diesen eingehen, in das Objekt hinüberwandert." Wundt, *Völkerpsychologie, part 2: Mythos und Religion, vol. 1* (Leipzig: Verlag Wilhelm Engelmann, 1905), 579.

[156] "Wie asthetische Einfuhlung und mythologische Personifikation nur dem Grade, nicht dem Wesen nach verschieden sind, so sind nun aber schließlich beide wiederum nur Modifikationen einer allgemeineren Funktion, ohne die das Objekt, das sowohl die asthetische wie die mythenbildende Phantasie voraussetzt, fur unser Bewußtsein nicht existieren wurde: der Apperzeption." Wundt, Ibid, 580.

[157] Worringer, "Introduction to the 1948 Edition," in Worringer, Ibid, xvii.

[158] See for example the two brilliant essays on this topic by Klaus Christian Köhnke, "Von der Völkerpsychologie zur Soziologie: Unbekannte Texte des jungen Georg Simmel," in Heinz-Jürgen Dahme and Otthein Rammstedt, eds., *Georg Simmel und die Moderne: Neue Interpretationen und Materialen* (Frankfurt: Suhrkamp, 1984): 388-429; "Soziologie als Kulturwissenschaft: Georg Simmel und die Völkerpsychologie," *Archiv für Kulturwissenschaft* 72 (1990): 223-232.

[159] See for example Georg Simmel, "The Problem of Sociology," *Annals of the American Academy of Political Science* 6 (1895): 52-63, in which he gives credit to Lazarus for encouraging his own interests in collective psychology.

[160] David Frisby, *Simmel and Since: Essays on Georg Simmel's Social Theory* (London and New York: Routledge, 1992), 22. For more on Hall see Boring, Ibid, 518-523. Hall, one might recall, invited Freud to give his first lectures in America at Clark University in 1909.

[161] According to Frisby, Simmel never made any reference to Wundt in his work. *Simmel and Since*, 181, n.66

[162] Worringer, *Abstraction und Einfühlung: ein Beitrag zur Stilpsychologie* (1908), trans. Michael Bullock as *Abstraction and Empathy*, (Chicago: Ivan R. Dee Publishers, 1997), 13. Subsequent citations refer to this edition.

[163] More specifically, Riegl's notion of the haptic likely came from Wundt's basic outline of tactile perception from the *Grundzüge*, in which he argued that knowing the world through touch allowed for a greater localization of sensations in space, which connotes a model of distinct and

often disconnected groupings of sense data. Higher modes of thought like apperception would knit these localized sensations into a unified experience. But without this faculty, one remains at this gestural level, as one finds in primitive consciousness.

[164] "It should be seen as symptomatic that the first volumes of Wundt's Völkerpsychologie had been published in Riegl's lifetime, exactly at the turn of the century, although I do not know if he ever looked at them. Riegl's insistence on the world view of historical periods emerges from this context, as does also his specific position regarding iconography." Julius von Schlosser, "Alois Riegl (1934)" in *Framing Formalism: Riegl's Work*, ed. Richard Woodfield (Amsterdam: OPA, 2001), 38.

[165] Margaret Olin, *Forms of Representation in Alois Riegl's Theory of Art* (University Park: Pensylvania State University Press, 1992), 108-109.

[166] Gombrich himself had a clear interest in notions of Völkerpsychologie, which is a topic that deserves further study.

[167] For example, Wundt argues, "Der praktisch bedeutsamste Beweis scheint mir freilich darin zu liegen, dass die Normen des Rechts nur aus einem realen Gesamtwillen jene verpflichende Kraft schopfen konnen, vermoge deren sie ihre unbedingte Herrschaft uber den Einzelwillen behaupten." Wundt, Uber das Verhaltnis des Einzelnen zur Gemeinschaft," Deutsche Rundschau, 1891, 203.

[168] Worringer, Ibid, 35.

[169] Worringer, Ibid, 45.

[170] Ibid, 15-16. Hal Foster has read this notion differently and in relation to Freud's *Beyond the Pleasure Principle* as the means to read Worringer's inorganic level. *Prosthetic Gods* (Cambridge and London: MIT Press, 2004), 142. It relies more on the physiological elementalism of Riegl's tactile stage, with its necessary alterior gesture logics and redemptive configurations. Its other major source is the ability of these levels to alter consciousness at rudimentary levels of movement

[171] Worringer, op cit, 41.

[172] In a more seemingly civilized society, one searches for an ultimate notion that previously one could get solely through effortless habit. Primitive man captures the thing in itself by utilizing specific techniques of stimulus response when s/he "experiences only obscurity and caprice in the inter-connection and flux of the phenomena of the external world" (Ibid, 18). Thus realization of essence in the primitive mentality is dependent upon isolation. Cognitive development construes a sense of mastery over objects in three-dimensional space, but one loses particularity of the

tactile in exchange for the overall panorama of the retinal. The consequent meeting of organically informed needs made primitives happy. Emotional needs of primitive art relied on the physiological habits of relating to the external world that one possesses in a certain context.

[173] Taking the notion of cultural relativism to new heights, Worringer presented savagery as a radical variant of Kantian cognition, but very ironically, in order to replace imminent categories of mind with mythic belief structures that were relative to a group. Readings of his work that ascribe to an assumed representation of the primitive as being closer to *noumena* overlook the fact that both Wundt and Riegl had made imminent Kantian categories impossible to uphold. Instead, each nexus of action patterns had its own ideal. Worringer uses notions from the Enlightenment in a manner that would indicate for his reader how faulty these notions truly are. His actual language presents the notion as entirely contingent, hypothetical, and subjunctive; based on a comparison of quantity or degree, rather than complete possession of a unified, imminent standard: "To employ an audacious comparison: *it is as though* the instinct for the 'thing in itself' were most powerful in primitive man" (Ibid, 18). Worringer uses Kantian terminology to create an ironic holding pattern for concepts of primitive mythic being that people outside the group view as transcendental, i.e. objects that one cannot experience with one's senses. *Völkerpsychologie* had framed intuition or instinctive motion (*Triebbewegungen*) as being relative to the common neural level of a particular culture. In the lights of their work, sensibility in the Kantian sense of the term (one's act of taking in sense data) depended on the culture, which meant that essences were still a valid premise, but only in the sense of multiplicity. In short, every group had its transcendental concepts, but there were no universal *noumena* anymore. Instead, these ideal beliefs found manifestation in mysticism and myths that each group created on the basis of its shared neurophysiology: "It is evident that transcendental notions in a religious respect, and the urge to abstraction in an artistic respect, are expressions of the same psychic disposition vis-à-vis the cosmos" (Ibid, 103). In primitive cultures, myth was ubiquitous in all its forms of practice, which instanced a conjoining of sense data and emotion. Plurality of sensory platforms gave each culture its own format of agency in the structuring of its ideals and aesthetic expectations.

[174] Worringer, Ibid, 37.

[175] Ibid, 18.

Chapter Three

Physiologies of Modernism: Dalcroze, Steiner, and Laban Read Wundt

"A true pedagogue should be at once psychologist, physiologist, and artist."

Emile Jaques-Dalcroze, 1915.[1]

The ways in which Wundt's work informed debates on empathy is only one facet of usages that comprise what was easily the most diverse range of responses to any discourse of psychology during the late nineteenth and early twentieth centuries. The motives for these approaches were very different, but the key to all of them lay in the nature of Wundt's theories. His voluminous writings on the fugitive nature of nerves at both the individual and social levels inspired cultural figures to approach his work as proof that one could shape these nerves into the bases of new experience and social forms. In the wake of Wundt's work, certain artists began to focus more deeply on rawer, more elemental forms of bodily energy, such as vibrations, currents, and especially rhythm, and the work they produced as a result was understood as capable of generating waves of energy that could alter the subject. Different practices of rhythmic group movement that unfolded in Switzerland between 1890 and 1920 constituted the most extensively structured utilization of Wundt's theories and establish the use of this psychology in the historical context of Zurich Dada, which is the subject of the next chapter.

It is crucial to introduce study of this avant-garde group's approach to Wundt's psychology with focused analyses of three different figures who were also working in

Switzerland at the time (and who were far more established in their careers). Each figure argued in a particular way that new expressive movements could alter consciousness according to the basic dictates of physiological psychology. First, the Swiss theorist of pedagogy Émile Jaques-Dalcroze (1865-1950) introduced eurhythmic exercises as the means of instilling a new sense of harmony in people. Second, the philosopher and occult leader Rudolf Steiner's (1861-1925) group exercises of *Eurhythmie* were intended to expose adherents to invisible realms of cosmic awareness. Steiner understood that these movements could then become the communicative means of higher truths in performances of non-verbal expression. Third, the dancer and theorist Rudolf von Laban (1879-1958) absorbed both Dalcrozean and occultist strains of ideas into his experimental choreography and worked extensively to shape Wundt's theories of the nervous system into a program for expressive, intellectual, and social reform. Each of these figures contributed to a broad phenomenon of German culture known as *Lebensreform*, which was the belief that a more organic, unified, and harmonious culture could arise from shaping and building new sensory and ambulatory platforms in groups of people by leading them through varying series of rhythmic movement exercises.[2] *Lebensreform* gave rise to many models of embodied community, or modes of social improvement in which people shared in movements that could lead to the development of similar nervous structure as the bases of common collective thought—especially in Switzerland in the years leading up to the arrival of nascent Dadaists in Zürich.

Cultivating Rhythm: Dalcroze and the Physiology of Eurhythmics

As one contributor to *Lebensreform*, Dalcroze is best known today for his development of eurhythmics that expanded on conventional methods of teaching rhythm. While working as professor of harmony at the Geneva Conservatory in the 1890s, he began to explore the ways in which knowledge of music involved more than just the ears and hands. In his seminal essay of 1909, "Rhythm as a Factor in Education," Dalcroze declared his realization that there were "two physical agents by means of which we appreciate music. These two aspects are the ear as regards music, and the whole nervous system as regards rhythm."[3] He believed that this system needed shaping, so that a person would feel rhythm within him or herself as a biorhythmic quality that coursed through the conduction paths. Feeling that rhythm was physiological, psychological, and metaphysical in terms of its impact, he developed a callisthenic training program in which students responded to certain rhythmic sequences with specific types of gestures that, he argued, would change nervous physiology and develop a person's sense of rhythm from innate qualities of his or her nervous structure. Various versions of Dalcroze's theories were extremely popular in the spheres of music, dance, and theatre during the decades before WWII.[4]

The most prominent stage of Dalcroze's career began in 1910, when he received a request from German industrialist Wolf Dohrn to found an institute of rhythmic training outside of Dresden in the town of Hellerau, a planned industrial community organized by the *Deutscher Werkbund*.[5] This broad consortium of architects, urban planners, and designers, heavily funded by Dohrn, sought to create a more harmonious relationship between the spaces and movements of work and those of leisure processes.[6] From 1910 to 1914, the Dalcroze Institute became a premier destination for many prominent

musicians, dancers, choreographers, theatre directors, and art aficionados (fig. 7). Dalcroze's time at Hellerau was surprisingly short-lived. The outbreak of the First World War on June 28, 1914 forced many of his international students to leave Germany, and, as a Swiss citizen, his own credentials became suspect.[7] He returned to Geneva in September of 1914, soon after which the German government turned the Institute at Hellerau into a quarantine hospital. Once Dalcroze was back in Geneva, he reopened his Institute apart from the *Werkbund* and increased publication of his ideas, which spread across Europe to Russia and to the United States well into the twentieth-century.

For Dalcroze, rhythm was simultaneously physical and metaphysical. It came to the subject as regularities of felt impulses. For example, in a 1915 essay titled "Music, Joy, and the School," he described rhythm as an essential source of life and consciousness: "Rhythm is the basis of all vital, scientific, and artistic phenomena. It produces alike the element of order and measure in movement and idiosyncrasies of execution."[8] Its strongest characteristic was constancy or sequence of movement as a bodily and psychological process—a metaphor for qualities of the most vital life forces and creative drives. Of utmost importance to Dalcroze was the belief that a person would eventually recognize and appreciate this quality of continuity above and beyond the mere physiological absorption of it. Representing rhythm as an all-encompassing force allowed him to construct its absorption possible for anyone, if he or she were trained correctly.

Dalcroze's description of rhythm as a spatial phenomenon also enabled this sense of availability, because rhythm traveled both in the spaces between people and through their bodies. He expanded on the dynamic qualities of rhythm by linking it analogically to other invisible phenomena that traveled in waves or currents and entered the body, like

electricity and radiation. For example, in a 1914 essay titled "Rhythm, Movement, *Soflège*, and Improvisation," he defined rhythm as a "force analogous to electricity and the great chemical and physical elements—an energy, an agent—radio-active, radio-creative—conducing to self-knowledge a consciousness not only of our powers, but of those of others, of humanity itself."[9] The tissue that received pulsations of rhythm responded with pulsations of its own and could mutate in order to meet the demands of new rhythmic stimuli. In his 1907 essay "The Initiation into Rhythm," Dalcroze argued that in any culture, being "musical" was the result of an "ensemble of physical and spiritual resources and capacities, comprising, on the one hand, ear, voice, and consciousness of sound, and on the other, the whole body (bone, muscle, and nervous system) and the consciousness of bodily rhythm."[10] These lines make it clear that for Dalcroze, the nervous system was the absorptive and expressive mechanism for all rhythm. Rhythm had physiological and spatial dimensions, and it was the goal of Dalcroze to use rhythmic training as an interface between body and space that would unite musical form and life processes. He taught that a person's capacity for rhythm depended on the extent to which his or her nervous system was attuned for the absorption of and reaction to pulsations. Specifically, nervous tissue and the processes of sending nerve charges throughout the body and to the brain became his main focus with respect to the physiological dimensions of his rhythm training.

The majority of his descriptions of the nervous system call attention to its mutable capacities. For example, in his 1912 essay "Music and the Child," Dalcroze presented the conductivity of the nervous system and its ability to be shaped as inextricable properties. He told his reader that he sought to "train" the nervous system "to extend and recuperate

its potentialities," believing that the human nervous system was not simply the base of all expression and experience, but that it had a dizzying array of untold possibilities with respect to these two qualities.[11] In his 1898 essay "The Place of Ear Training in Musical Education," Dalcroze stated that his ultimate goal was to awaken "the multiple agents of vibration and resonance lying dormant in our bodies."[12] Processes of intake and expression in the nervous system had to change if the body was to become a proper vehicle for rhythmic expressions. A person's capacity for rhythm depended on how attuned his or her nervous processes were for the absorption of and reaction to the regularity of its pulsations. In linking a person's capacity for rhythm to how he or she embodied rhythm with gesture, Dalcroze sought to shape the strength and transmission quality of innervation—the processes by which the brain sends nervous impulses throughout the body. As he described it in his essay "Rhythm as a Factor in Education" (1909), Dalcroze sought to cultivate a "rapid and regular current of communication between mind and body."[13] Focusing on innervation made a person's orientation to culture a question of his or her nervous physiology. This perspective underlay his curricula of repeated bodily movement as trained responses to rhythm that would, he believed, open new paths of nervous conduction in the body as the basis for an improved sense of rhythm.

Dalcroze likely knew Wundt's texts, but he also learned of Wundtian theory indirectly from his friendship with the Swiss psychologist Édouard Claparède (1873-1940), a star student of the Swiss psychologist Théodore Flournoy (1854-1921), who had obtained his doctorate in Leipzig with Wundt.[14] Claparède was particularly fascinated by cases of post-hemiplegic hemiataxia, in which a person is paralyzed on one side of the

body but nonetheless makes uncontrollable movements on that same side. This disorder formed the topic of his first major work, *Du Sens Musculaire à propos de quelques cas d'Hémiataxie posthémiplegique* (1897).[15] Wundt's basic theory of innervation provided Claparède with a comparative base of normalcy for understanding the ways in which uncontrollable movements instanced faulty innervation sensation (*Innervationsempfindung*), or the feeling that a person has of his or her own bodily movement, which varies in relation to the type of movement.[16] Claparède credited the German psychologist as the "representative" of a four-step process of movement types—instinctive, reflex, willed, and automatic—that unfolded in the formation of any motor practice (fig. 8). Wundt, Claparède argued, "has himself refined and made dominant this central theory. He thinks that these sensations of movement have as their seat motor nerve cells to which they are linked in motor innervation."[17] As the body became accustomed to moving in certain ways, the nature of innervation changed as the nerve paths shifted. Conduction gradually became uninhibited and habitual enough to make the movements automatic.

This four-step structure became a key source for Dalcroze's formulation of his pedagogical method, for it allowed him to conceive how the correlation of new movement patterns and certain sequences of rhythm would create within the subject a higher regularity of movement that would, with practice, eventually become automatic. Indeed, Claparède could be describing the basic characteristics of Dalcroze's coursework when he wrote that the notion of automatic movement being the endpoint of the four-step trajectory "is justified by the fact that certain movements that are executed often (walking, playing the piano), although primitively voluntary, become automatic with

practice (*l'éxercice*)."[18] Dalcroze understood that this process was something that an outside agent could shape, thereby strengthening qualities of innervation and creating a heightened sense of rhythm. As he wrote in "The Place of Ear Training in Musical Education" (1898),

> If, up to the present, muscular movements of hand and fingers alone have sufficed to create in the mind a distinct consciousness of rhythm, what far more intense impressions might we not convey were we to make use of the whole organism in producing the effects necessary for the evocation of motor-tactile consciousness?[19]

The central idea of eurhythmics was that culture could alter the nervous system according to new systems of movement-based interaction. "Intense impressions" bespeak stronger impulses of nervous conduction or innervation sensation—a quality in direct proportion to the quantity of nervous conduction in the body. Creating new practices of automatic movement triggered manipulations to the structures of the body's nervous fibers that had immediate connections to propriety of intellect in cultural expression.[20] In drawing on Claparède's work and its reliance on Wundt, Dalcroze gained a full awareness of the nervous mechanics involved in making certain movements become automatic.

From Claparède, Dalcroze also found validation for his beliefs that the forms of group movement and rhythm were particular to culture. Claparède's thoughts on movement forms presented in this direction as well, for the psychologist had made Wundt's *Völkerpsychologie* into the framework for understanding how instinctive movements [*Triebbewegungen*] that appeared most natural to a person in a culture were, in fact, the most heavily inculcated. "To explain the possibility of instinctive movement,"

Claparède wrote, "Wundt must consider it as a mechanical consequence founded on hereditary organization and exterior excitants."[21] Claparede's attention to heredity coupled with exteriority indicates his adherence to the Wundt's theory from this text that space and culture determined formation of instinctive movements as the beginning of the continuously mutable four-step process Claparede had described. Following this line of thought, in his essay "Music, Joy, and the School" (1915), Dalcroze acknowledged the cultural diversity of rhythm in terms borrowed from Wundt's *Völkerpsychologie*: "The study of rhythm conduces to the formation of an individuality for all purposes of life—that is, a manner of expressing oneself according to the rhythm most natural and *native* for one's being."[22] In other words, natural orientation to a rhythm had any number of native variants that resulted from cultural processes. These notions of the natural as native had appeared in his earlier essay, "The Place of Ear Training in Musical Education" (1898), in which Dalcroze was more specific concerning his belief that rhythmic form depended on certain arrangements of nerves that people in a group shared:

> Style in music varies according to climate and latitude, and, by corollary, according as temperaments are influenced and modified by social atmosphere and conditions of life. The divergences of harmony and movement which characterize the music of different peoples spring, then, from the nervous and muscular state of their organisms.[23]

These lines indicate the pedagogue's understanding that rhythm was an expressive emanation of particular nervous structures that a society had in common. These rhythms yielded a probable projection of a group's nervous formats and psychophysiological outlook.

But Dalcroze diverged from the basic tenets of *Völkerpsychologie* in a manner that spotlights the difference between institutional psychology's analytic outlook and the ambitions of figures that used this psychology to inform their work of cultural and social reform. Dalcroze believed that the "nervous and muscular state" of the individual human organism as part of a culture could be deliberately modified in order to meet certain goals of culture, expression, and society. He did not, as Wundt did, stop at seeing culture as resulting from a probable group nerve structure. Rather, Wundt's work provided Dalcroze's point of departure. He took from physiological psychology the means for an entirely separate educational program that sought to shape bodies and reformed the senses of the group through processes of rhythmic movement. At a social level, he believed that ambulatory interactions with rhythm, a basic element of art, would alter the physiological bases of the expressive imagination, rather than stand as a product of pre-established consciousness. Thus, Dalcroze knew full well the tenets of *Völkerpsychologie* but moved against its analytical trajectory by treating nerves as the bases of thought and feeling that a person could shape *by means of culture*. It is to the specific characteristics of these exercises in shaping that we must now turn.

Characteristics of Dalcroze's Exercises

Dalcroze began work at a time long after Wundt's lab had established the idea that one could test and observe processes and changes of nervous innervation. Dalcroze framed the development of his method in terms of observing and testing that were more proper for describing the practices of Wundt's laboratory. For example, in 1909 in "Rhythm as a Factor in Education," he declared that "experiments many times repeated"

supported his method of using the body as the means to train the mind's awareness of rhythm.[24] His ultimate goal in these experimental studies was to uncover the ways in which there existed "intimate relations . . . between movements in time and movements in space, between rhythms in sound and rhythms in the body."[25] Based on these discoveries, Dalcroze developed callisthenic exercises in which these relations were built through a regimen of developmental education. A systematic, ascending complexity of movement drills gave new significance to all gestures, in which the form of a gesture signified its varying degree of correlation to rhythmic sequences.

Dalcroze outlined his overall method most succinctly in his 1914 "Rhythmic Movement, *Soflège*, and Improvisation," in which he argued that cultivating more rhythmic practices relied on learning anew the movements that were necessary for breathing and those that were not. According to Dalcroze, the student lies down,

> relaxes his whole body and concentrates his attention on breathing, in all its processes; then on the contraction of a single limb. He is then taught to contract simultaneously two or more limbs, or to combine the contraction of one limb with the relaxation of another. This enables him to note its muscular resistances, and to eliminate those that serve no purpose.[26]

At this rudimentary level and with no musical accompaniment, Dalcroze sought to make his students more aware of the most rudimentary innervation sensations. After teaching them how to breathe properly, Dalcroze taught his students how to walk again—that is, to march in time to basic rhythms by moving their arms and legs in place. Dalcroze was clear that these basic exercises, often repeated, were intended to reshape structures of innervation: "It is only by dint of repeated exercises that, eventually, distinct automatisms

are created."[27] This process triggered innervation impulses through their motor pathways and made for clearer transmissions of nerve energy.

Marching and moving arms to different time signatures gradually became more complex. For example, upon hearing a signal, students shifted action in time "to stamp suddenly or contract the arm on a different beat, or to substitute a leg movement for an arm movement."[28] Reacting with bodily motion to rhythm as stimuli introduced new nervous intensities and had immediate applicability to the reforming the expressive nature of a collective (fig. 9). Dalcroze sought to achieve these ends with exercises of group callisthenic movements he termed *Turnen* and defined in 1898 as "a new system of gymnastics applied to the nervous system."[29] This word was a direct reference to Friedrich Ludwig "*Turnvater*" Jahn (1778-1852), the nineteenth-century German pioneer of physical education, who introduced his *Turnverien* or group calisthenics as a way to revivify the race and military power of Germany.[30] The *Turnen* exercises of Dalcroze gained ready absorption due to an fascination with physical culture across Europe and the United States, although the Swiss origins of the school and its international student population gave the Dalcroze method less of a nationalist overtone than the earlier model of Jahn.

Like Jahn, however, Dalcroze used these callisthenic exercises to increase the amount of innervation that was at work in a student's body and do so in a manner that immediately connected the reformed neurophysiology of the individual to a broader arena of group practice.[31] Stretching and moving limbs as part of a group surrounded a student with plastic manifestations of movement in space that were harmonious, but not entirely indebted to him or her as an individual. When students had successfully developed this

new regimen of movements, Dalcroze gradually introduced more complicated exercises of dissociated movements or sets of simultaneous gestures that followed conflicting time signatures. He carefully structured these motions of dissociation in a manner that enabled the student to grasp the complexities of playing an instrument. For example, playing softly (*piano*) or strongly (*forte*) required different but simultaneous movement energies that a performer had to ultimately balance automatically:

> Just as, on the piano, one hand may play *forte* to the other's *piano*, so the plastic expression of vitalized musical rhythms demands conflicting nuances of muscular innervation in different limbs. Special exercises enable the student to contract a certain muscle in one arm, while the same muscle in the other arm remains relaxed. Other exercises show him how time may be subdivided in one way by one limb, in another by a different one—e.g., by the execution in a given time of three equal movements with the feet and two, four, or five with the arms.[32]

These routines of organized motion trained a student's nervous system to regulate a harmonious association between different gestures, so that an individual's movements literally embodied rhythm. Ultimately, these dissociated movements became harmonious and automatic, allowing a student to build on simple callisthenic exercises and weave together different harmonic or rhythmic sequences as automatic and simultaneous sequences of bodily ambulation. Initially, these more complex exercises in rhythm were gestural, which increased the intake of rhythm in direct proportion to the quantity of movement and innervation. These complexities gave way to exercises in polyrhythm, in which a student moved his or her limbs to different meters at the same time.[33] Performance of these coordinated movements signaled that the student had mastered

rhythm to the extent that he or she had internalized simultaneous plastic manifestations of rhythm that were gradually becoming automatic.

Discovering the connections between movements in time and movements in space, and between sound and the body, created an interface between body and space in which a student interacted in coordination with rhythm as perceived stimuli.[34] An individual literally embodied the vibrations of the music, but had to undergo neurophysiological alteration as a result of training. In his heavily formalized public demonstrations, Dalcroze enacted his belief that meeting the demands of rhythm with concretized actions in space allowed the mind to connect more forcefully to rhythm through the body's sensations and qualities of innervation that were far more expansive than previous methods of musical pedagogy (fig. 10).

Implications of the Dalcroze Method

The availability of Dalcroze's method as an intellectual source transcended music pedagogy. In addition to the figures discussed below, others who were fascinated with eurhythmics ranged from the pioneering French stage director Jacques Copeau to the Russian director of the *Ballets Russes*, Sergei Diaghilev, and his principal dancer, Vaslav Nijinsky, the last of whom specifically incorporated eurhythmic methods into training his dancers for their performance in the legendary ballet of Igor Stravinsky's *Le Sacre du printemps* (1913).[35]

These theories had a broad impact on European cultural practice in its overall tenet that valid expression required physiological cultivation—the making of an entirely new body— prior to any aesthetic valuation or projection of emotional qualities onto a

work of art. It expanded potentials of what bodily movement could do to the body and mind. In focusing on nerves as the basis of expression, Dalcroze created a system in which gesture signified an orientation to culturally acceptable codes of harmony that correlated to structures of allegedly normal mental operation. It is not exaggeration to state that for Dalcroze, learning to exercise one's ability as a performer of culture required that a person had to rebuild the most basic neurophysiological functions of his or her mind and body.

What was normal in this context? Something that appeared natural to someone in a culture would, following Wundt's dictates, result from conditioned motor response to exterior conditions and conceptual associations of that culture. But even in that broad sphere of embodied relativism, Dalcroze believed that the ostensibly natural manner of motion that unfolded in the making of culture, such as simple instinctive movements—the most natural forms of movement and overall spatial orientation—were, for his purposes, insufficient for artmaking. Rather than understand culture as the projection of a group that composed ambulatory and intellectual practices in response to tradition and external conditions, Dalcroze believed that performing culture relied on being other than the immediately natural. Thus, one finds a strange duality in the relationship between normalcy and improvement in this context that does not appear in other instances of *Körperkultur*, because rather than simply becoming stronger in body and morals, Dalcroze's students intended to reshape themselves so that they performed culture in a way that no one else could, because no one else was built the same way internally.

Making this sort of metamorphosis a necessity for the performance of culture was far more extreme than the level of change one generally associates with contexts of

education [*Bildung*], in which one builds on pre-existent formats. Dalcroze, by contrast, was unequivocal that his method was a kind of "scorched earth" policy from beginning to end. As he declared in his 1909 essay "Rhythm as a Factor in Education": "Let us therefore assume the responsibility which nature puts upon us, and consider it our duty to regenerate ourselves; thus shall we help the growth of more beautiful humanity."[36] He sought neither a "return" to a more harmonious orientation of mind and body, nor mastery of a pre-existent structure, but an outright remaking of a person's neurophysiological foundations. For Dalcroze, people did not make art. It was the other way round.

At the Dalcroze Institute, the body would be restructured, but the rhythms used in the lessons and exercises remained the same. However that sameness, that normalcy—which for Dalcroze formed the essence of rational and valid artistic production—was, for all interested parties, a property that underwent a major shift in terms of its comprehension, so that it was the same only in the most superficial sense. The formal patterns of culture—the beats, meters, notes, and time signatures—did not change as marks on the page, but these patterns now lived within the self and a person moved in a manner that emphasized this internalization. But the physiological bases of social consensus among people trained in the Dalcroze method had made them literally other than the broader society that appreciated and sanctioned cultural practice that had rhythm.[37] People were rebuilt to make art in a better way, but as a result became physiologically separate; a band apart at the level of the tissues.

More critical readers of Dalcroze caught this explosive contradiction within the eurhythmic method and used it to their advantage as the means to deviate bodily,

mentally, and spiritually from the norm. Scholars have established the socio-political implications of Dalcroze's theories, but augmentation of their work allows for comprehension of the reasons that so many radical figures were fascinated by such an allegedly conservative figure.[38] Users of eurhythmics who deviated from Dalcroze were more interested in making culture actively manifest real psychological diversion from the norm, rather than conveying a newly heightened sensitivity to pre-existent cultural forms.

Rudolf Steiner and the Occultism of Nerves

Occult philosopher Rudolf Steiner incorporated eurhythmic methods and the physiological psychology attached to these practices into the philosophy and practice he developed in the context of Theosophy. In contrast to the pedagogical ambitions of Dalcroze, which never left the boundaries of musical acumen, Steiner used movement exercises in his occult teachings as a way for students to gradually learn to encapsulate the energies of their souls in physical space. Wundt's works on physiological psychology and culture provided a key source for Steiner's application of rhythmic group movement to his ambitions to tap into cosmic rhythms and ancient wisdom of the occult tradition.

Born in an area in the Austro-Hungarian Empire that is in present day Croatia, Steiner studied in Vienna at the Technische Hochschule from 1879 to 1883 and from 1888 to 1896 worked at the Goethe archives in Weimar.[39] From 1899 to 1901, Steiner quickly rose in prominence among members of the Theosophist circle and became head of the German chapter of the International Theosophical Society in 1901.[40] Theosophy was a philosophy and occult practice that arose to prominence through the writing of Helena Petrovna Blavatsky (1831-1891), who claimed that she was a chosen prophetess

who represented a timeless brotherhood of Adepts or sages known as the Mahatmas, who transmitted secret esoteric wisdom to her.[41] After Blavatsky's death, Annie Besant and Charles W. Leadbeater continued the group and moved its headquarters to India.[42] Generally, Theosophists opposed positivism, but embraced developments in science that undercut materialism, arguing that this new knowledge affirmed the existence of higher truths within forms of ancient wisdom.[43] Steiner eventually broke with theosophy at the end of 1912 and formed his own doctrine of Anthroposophy, which nonetheless drew extensively on his earlier involvement with Theosophy.[44]

In his approach to science, Steiner followed the general interest among occultists in new forms of science.[45] As Perry Myers has argued, Steiner saw science as the necessary second half of an overall *Bildungsideal* or philosophy of educational reform that, coupled with guided exercises of concentration and meditation, would lead humanity into an evolution of consciousness beyond the world of mere empirical data to higher spheres of existence.[46] Steiner cultivated a particular combination of science and occultism in a manner that would, he believed, build new organs within the body and mind that were geared toward the reception of supersensory data of higher cosmic realities. His newly enlightened adherents would then communicate these higher truths to others in public performances with routines of rhythmic movement known as *Eurhythmie*. Steiner drew on Dalcroze eurhythmics, but departed entirely from his method in terms of what the movements encapsulated and the physiological changes that Steiner believed took place during a student's training in these exercises. Contrary to simply plasticizing rhythm, Steiner thought these movements could communicate an awareness of eternal wisdom that was beyond the senses of an untrained person.[47] In

contrast to the trances, hypnosis, or mediumistic activities of other spiritist or occult pursuits, he sought a mode of higher consciousness that was a lucid realization of an active search.

Steiner's clearest use of science for this reform was the work of the figure that he had rejected most strongly. Steiner carefully utilized Wundt's ideas of nervous change and collective thought as the basis for his program of social reform. In his 1909 text, *The Spiritual Hierarchies and the Physical World: Reality and Illusion*, Steiner placed the blame squarely on Wundt for the problems in modern thought that he sought to remedy. A full quotation gives the reader a sense of its vitriol:

> I have drawn attention to the fact that, in nineteenth-century German psychology, the expression "soul theory without soul" gradually came into use. The world-famous school of Wilhelm Wundt, which is influential not just in German speaking countries, but is greatly respected wherever psychology is discussed, made this "soul theory without soul" fashionable. This "soul theory without soul" describes soul qualities without presupposing an independent soul entity. Instead, all qualities of the soul first come together in a kind of focal point, that is, gather themselves in the I. That is the greatest absurdity that has ever been linked to a theory about the soul. Yet psychology today stands completely under its influence; today, this notion is celebrated throughout the world. Cultural historians studying our era in the future will have their work cut out for them if they wish to explain plausibly how such a theory could ever have been regarded as the greatest achievement in the field of psychology in the nineteenth century and well into the twentieth.[48]

These words testify to both the prominence of Wundt's work and the need to think otherwise among more radical figures in culture. Steiner described Wundt's notion of the soul as that which forms from a processes of innervation outside any possible connection to a metaphysical realm. But rather than reject Wundt's psychology entirely, Steiner saw his doctrine as the necessary next step in developing a higher mode of knowledge that brought the newly understood physiological mind into balance with the metaphysical world of the soul. This dialectical "occult science" would attempt to uncover the spiritual realm in the newly understood material world, which would then allow one to reflect back on the supposed empiricism of observed things and recognize the higher realities of the world and one's own consciousness.

Steiner lauded Wundt's *Völkerpsychologie* in a manner that made the psychologist's theories of collective thought and ritual into a major support for his overall program of Anthroposophy and its performative dimension of *Eurhythmie*. Comprehending how Steiner saw Wundt's work on culture as an inspiration can help illuminate the physiological nature of his occultism. Shortly after he established his new doctrine of Anthroposophy, Steiner gave a lecture in Berlin on November 27, 1914, which was published the same year as a pamphlet titled *The Soul of the People Considered in the Light of Spiritual Sciences*. In proposing a turn toward a more spiritual dimension of science, or a scientific pursuit of higher realities, Steiner called attention to the recent publication of Wundt's tomes on culture as providing the best way to understand the manner in which pursuit of higher knowledge could unfold most successfully as a collective effort:

Thus Wundt, the Leipzig philosopher, who is so highly esteemed, and who

> certainly cannot be accused of any inclination towards the spiritual-scientific view of things, cannot avoid seeing in the group spirit something real, something to which he attributes an *organism* and even a personality.[49]

Then, a bit later in the talk, he returns to the psychologist's work to define what he meant by "group spirit," or the collective mentality and the nature of its formation: "Wundt sees in the language, customs, and religious views, as lived by a whole people, a certain organism; he even says that this life expresses a certain personality."[50] Steiner saw great potential in the notion that each group was a different sort of organism that undertook its own specific practices in pursuing what Steiner called "the membering of the soul," or the encapsulation of inner feelings of higher, non-empirical awareness with movements in the immediate world of the senses.[51]

Steiner believed these higher forms of knowledge came from actual physiological growth that occurred as a result of his different regimens of eurhythmic exercises. During their studies, he argued, they would develop organs of perception that untrained individuals did not have. As he outlined in his 1909 text, *Outlines of Arcane Sciences* [*Die Geheimwissenschaft im Umriss*], Steiner's exercises in consciousness, concentration, meditation, and collective group movement were meant to cultivate new or higher cognitive or perceptual organs [*höheren Wahrnemunsorgane*] that allowed one to glimpse higher reality resulting from spiritual practices [*geistige Übungen*]. Steiner distinguished these organs from better-known sense organs:

> These new organs of perception are first of all to be distinguished from those of the physical sense-world by being active organs. Whereas the eye and ear are passive, allowing light and sound to work upon them, it may be said of these

> perceptive organs of the soul and spirit that, while functioning they are in a perpetual state of activity, and that they seize hold of their objects and facts, as it were, in full consciousness. This gives rise to the feeling that psycho-spiritual cognition is a union with—a "dwelling within"—the corresponding facts.[52]

One cannot miss the correlation in terms between these new sense organs and their social manifestation in a collective, for in the 1914 essay cited above, "organism" was the term Steiner applied to the Wundtian notion of collective group thought that interested him so deeply, which, as any reader of Wundt knew, had to arise from new forms of group practice. *Übung* is a loaded term as well, due to its prevalence in Wundt's works as the end result of any repeated action; however, in Steiner's hands, it becomes the process by which an individual physiologically develops an organ that senses metaphysical experience. As he asserted in this same text, "A regular course of training arranges and orders the separate exercises to be practiced by the occult student, so that these organs may either simultaneously or consecutively attain their suitable development."[53] In combination with meditation and concentration exercises, Steiner's *Eurhythmie* routines would foster the growth of these organs of higher perception arising from new practices that altered consciousness.

Steiner believed that through his practices of *Eurhythmie* would enable an evolution to a higher mode of consciousness through new forms of collective group movement. These movements were collective performances that unfolded before an audience at the Goetheanum, a large theatre complex and teaching center that Steiner opened in 1919 in Dornach, Switzerland, the same year that he opened his first Waldorf School in Stuttgart, which also had *Eurhythmie* on its curriculum. Steiner's approach to

organized group movement was more ritualistic and yet more in line with visualizing spiritual impulses and dynamic forces of the soul that one feels alongside others in the group as higher forms of active cognition.

It helps to remember that this process of change was also the basic logic of Dalcroze eurhythmics, but Steiner departed drastically from Dalcroze's use of bodily exercises to foster a greater awareness of rhythm. Steiner's goal, by contrast, was to use expressive movement in a manner that allowed devotees of both Theosophy, and later of Anthroposophy, to develop and then publicly express their new forms of collective knowledge that were apart from the immediacy of the empirical world. Steiner was training prophets, rather than musicians or dancers. However, artists still served a key role in the project of awakening people to forms of higher reality. As he outlined in his 1923 "Lecture on Eurhythmy," artists exemplified the ways in which, at any given moment, certain figures in a culture possessed the power to create works of art in any medium that made inner feelings of non-sensory reality visible:

> In each art, certain spiritual impulses were poured into humanity from higher worlds. These impulses were taken up by certain individuals specially fitted to receive them, and in this way, through human activity, pictures of the higher worlds were reflected in the physical world; and the various arts came into being.[54]

The human activity that Steiner focused on in these lines was not visual art, but a certain system of movement that allowed for plastic encapsulation of higher realities beyond the senses in a context of artmaking. Steiner's goal for *Eurhythmie* was to have a similar system of choreographed movements that activated this mode of higher awareness in

society. Thus, the forces of form in a work of art communicated a person's soul content, what he or she felt individually and could then communicate to others through certain forms of movement that were comprehensible to the group.

Nowhere is this particular connection of motor movement—ostensibly the simplest form of sensation—and higher forms of consciousness or soul-awareness more apparent than in Steiner's particular applications of physiological psychology to the broader Theosophical notion of the "etheric body," which had connections to both ether physics and theories of the spatial fourth dimension as an enabler of higher consciousness.[55] As Steiner described it, this entity was a double of the physical body, equal to it in size and form, which served as an intermediate between the soul (or astral body) and the physical body. The etheric was one of the four bodies Steiner believed that each person had and which connected him or her to both the sensory and cosmic world. They were, in order of importance: the physical, etheric, astral, and the I-body. Only the first was visible, but through careful study one could contact and balance the harmonies of the other bodies in relation to the rhythms of the Universe.[56] In his 1904 text, *Knowledge of the Higher Worlds and Its Attainment*, Steiner described the etheric body as such:

> The etheric body has approximately the size and form of the physical body, so that it practically fills the same space. It is an extremely delicate and finely organized structure. (I beg the physicist not to be disturbed at the expression 'etheric body.' The word ether here is meant to suggest the fineness of the body in question, and need not in any way be connected with the hypothetical ether of physics).[57]

Despite this qualification, Steiner described the substantive nature of the etheric body in a manner that drew directly on ether physics: "the particles of the etheric body are in continual motion. Countless currents stream through it in every direction . . . at a certain stage, development consists precisely in adding to the unconscious currents and movements of the etheric body others that are consciously produced and controlled."[58] Steiner followed the central Theosophical tenet that a close study of doctrine could lead to an evolution in consciousness or a clearer seeing into reality (clairvoyance).[59] For Steiner, the soul's energy existed in this field around the self that an adept could detect with organs of higher perception and then tap into and encapsulate in the seen world with the movements of *Eurhythmie*, which he used as his form of collective, non-verbal communication of higher truths.

Within Steiner's reformation of bodily gesture as a concept of expression, plastic art was another key context in which he argued that the energies of the etheric body were encapsulated within the rhythms of physical movement. According to Steiner, expressions from an etheric body relied for their power on the relationship between the nature of movement and the subject's connection to the energies of the body as it related to the soul. He asserted that when an artist (in this case, Greek) positioned the limbs of a sculpted figure into a certain attitude,

> the position and arrangement of muscles were an actual experience to him. He had an inner understanding of the possibilities of movement in the arm and hand, of the possibilities of muscular expansion and contortion. And he was able to bring this inner experience to physical expression, making use of physical materials.[60]

For Steiner, being in contact with the higher truths of the etheric body enabled a connection between the world of the soul and the world of the senses, which the artist could then transmit in plastic form. Thus, artmaking overlapped with *Eurhythmie* in the sense that the metaphysical dimensions of movement energies in each context arose from particular physiological arrangements of innervation that, Steiner believed, came from a connection to the etheric body and its cosmic energies of higher harmony. The organs of higher perception that a person worked to develop would form in accordance with these basic laws of neurophysiological change, but the changes to consciousness were far beyond any boundary of empiricism.

In his *Knowledge of Higher Worlds and its Attainment*, Steiner merged the neurophysiological and the metaphysical when he described this new organ of higher perception as a kind of metaphysical cortex that sent and received currents and vibrations in correspondence with the etheric body. Through extensive training, the student's body and mind would begin to undergo physiological changes: "Thus a preliminary center is formed for the currents of the etheric body. This center is not yet in the region of the heart but in the head, and it appears to the clairvoyant as the point of departure for movements and currents."[61] This notion of a center for currents and movements follows Wundt's notions of cortical development to the letter—only now, the center in the body is a meeting place for all the impulses and vibrations from the etheric body. In crafting Wundt's empirical science into the enabling structure of cosmic awareness, Steiner offered an intriguing solution to the positivist and taxonomic orientations he perceived in the psychologist's work: he used those very theories as the basis for developing techniques that fomented an evolution of consciousness.[62]

In addition to his rather unique take on the possible range of physiological growth, Steiner's belief that his *Eurhythmie* embodied and communicated a spiritual impulse with plastic movement relied heavily on Wundt's arguments from the *Völkerpsychologie* that primitive consciousness and ritual practice were group ideas based on shared movement patterns. Steiner understood this notion as a sign that properly modified collective action could create a new form of knowledge. In this tenet, he paralleled Dalcroze, but the nature of what constituted this knowledge for Steiner separated him from the music pedagogue. Steiner drew on Wundt to understand his pursuit of creating for modern Europeans the ways in which earlier cultures had experienced occultist phenomena in the world of the senses. In his lecture of 1922, "The Imaginative, Inspirative, and Intuitive Method of Cognition," Steiner outlined the importance of primitive consciousness as a nexus of soul content and sense data that relied on a certain physiological arrangement. In experiencing this fusion of the spiritual and physical in the world of the senses,

> primeval man could also experience the physical and soul elements of the outer world nearly as intensely as, if I may put it this way, he experienced himself in his lungs, his heart, the processes in his stomach, liver, and so on.[63]

Steiner borrowed Wundt's ideas but shaped them to fit his needs, arguing that in contrast to Wundt's theory that primtive religion relied solely on collective physiological structure, the primitive in fact had contact with the eternal harmonies of the soul on the same level as physiological properties like innervation sensations.

Primitive society exemplified Steiner's idea of reaching once again this particular state of correlated body and cosmic processes, not as a return to some lower form of

civilization or "primitivism," but as a return to a mode of society that was more inherently connected to higher realities of the universe, to the extent that one perceived everyday life in direct connection to it. *Eurhythmie* allowed students to use their own bodies as an abstract (non-empirical) spatial language that could forge before them in space the formal nature of these cosmic harmonies. One had to build the physiological bases of this group practice that could boast these cosmic connections, thus taking Wundt's notion of collective physiology and grafting onto it what Steiner perceived as evidence that primitive cultures were in immediate contact with a group soul in the realm of the senses.

In this vein of developing rhythmic movements of non-verbal communication, Steiner drew extensively on Wundt's notions of gesture language in primitive cultures that appeared in the *Völkerpsychologie* as proof that one could express higher realities with bodily movements. In his 1922 lectures at the Goetheanum, Steiner described the ways in which spoken utterance in primitive language was always "enhanced by accompanying movements of the legs and arms, so that a kind of dancing was added. Especially was this the case when a dignified form of expression was sought, the form of some ritual or cult."[64] Like the Greek artist, the primitive individual concretized an inner experience in plastic form. In this claim, Steiner echoed Wundt's theory that primitive language was more conspicuously based on tactile movement energies than concepts based on, but separated from, empiricism.

That basis, Steiner believed, brought primitive language into closer contact with the rhythms of shared soul content in a group. Based on the idea that primitives' spoken and gesture language expressed their supersensory orientation, Steiner argued that in

order to create anew this mode of heightened consciousness, one had to see these gestures from earlier societies for what they were:

> It is only possible to gain a true understanding of what lies behind these things, when one realizes that what otherwise appears only as gesture accompanying speech can gain for itself independent life. It will then become apparent that movements which are carried out by the arms and hands, from the artistic point of view, can not merely be equally expressive, but much more expressive than speech itself.[65]

Steiner's description of the metaphysical potential within arcane gesture language suggests that he sought an evolution of consciousness that active cognition exercises like meditation and concentration would initiate and that plastic movements of *Eurhythmie* would embody in plastic form. In *Eurhythmie*, this non-empirical gesture language, built gradually in accordance with physiological psychology's notions of nervous change, developed organs of higher cognition and movements that expressed the truths that these organs had perceived.

Embodiment of these truths had nothing to do with notions of "representational" or "abstract" gestures, both of which relied on the barometer of empiricism, but rather concerned the nature of an artist's connection to the broader soul life of his or her community. It was for this reason that Steiner connected so strongly to the cultural nature of gesture language—the notion of "observational" varied with each culture, and only the eternal truths of higher consciousness as expressed with bodily motion superseded these more local concerns, which allowed the gestural manifestations of higher truth to avoid a tired dichotomy and connect to an eternal truth beyond the world of the senses.

Thus, a work of art that contained ostensibly representational depictions could still suggest cosmic realities in the nature of its gestural energies. What mattered for Steiner was whether the soul's energy had been communicated into the work. It was a quality of movement, a perceived energy of gesture, rather than a difference in the image or object. Steiner felt that the Greeks, arguably the paragons of representational art as it appears in Western art discourse, were like primitive cultures in their skill at communicating the soul energies of the etheric body. Following this line of thinking, Steiner encouraged his followers to look past resemblance and understand how the energies of gesture encapsulated the movements of the soul:

> Thus the Greek sculptor incorporated into matter a real, inward experience, not merely the external impression of the eye. He did not say to himself: the lines go in this or that direction, and then proceed to embody in plastic form the perceptions of his physical senses; but for him it was indeed an actual inward experience which he recreated out of the creative forces of nature, and entrusted to external physical matter.[66]

Steiner sought to focus on whether the artist encapsulated in his or her plastic movements the metaphysical content of inner feeling, which could appear in either representational or abstract art. For him, the crucial property of expression concerned whether the movements conveyed the sense of a world beyond the senses. These forms of higher reality required deliberate exercises for realization—a reshaping of the body and a growth of new organs geared toward the cognition of higher realities beyond the world of the physical body. From his contacts with the ideas of both Dalcroze and Wundt, Steiner

truly believed that the proper exercises could connect one to rhythms of the soul and its cosmic harmonies through the paths of newly altered nerves.

Laban and the Expansion of Expression

The dancer and choreographer Rudolf von Laban was another figure involved in exploring how new expressive motions could alter the minds of a group. His writings contain the most extensive foray into the physiological and cultural theory of Wundt ever to appear in the context of rhythmic group movement during the 1910s and 1920s. In contrast to Steiner, Laban was more interested in repurposing the ideas of Dalcroze to modify the expressive nature of dance, and although he was connected to occultism, he did not dedicate his productive output to expressing the values of this doctrine.[67]

Laban had met Dalcroze as early as 1910 and conversed actively with him both before and after WWI.[68] Laban had no formal musical training, so his development of choreographic theory and his overall ways of thinking about dance and expression drew heavily on his contact with the pianist and dancer Suzanne Perrottet (1889-1983) and the dancer Mary Wigman (1886-1973), both of whom were former Dalcroze students who had not yet achieved the prominence they have today.[69] In the summer of 1912, Laban met Perrottet at a sanatorium after suffering exhaustion in Munich from trying to establish himself as a dancer.[70] These hardships convinced him to leave Germany for Switzerland in May 1913, where he began teaching courses at a commune called Monte Verità.[71] Both Perrottet and Wigman joined him in July of that year, and the three began work on founding a new dance school in the commune.

During WWI, Monte Verità became a refuge for groups of conscientious objectors of all stripes who practiced anarchism, feminism, polygamy, shared cultivation of agricultural self-sufficiency, nudism, *Naturphilosophie*, and vegetarianism.[72] Several forms of cultural production were rife in the commune and many were geared toward the production of so-called "craft" objects like woodworking or textile production that the commune members could use in everyday life. In addition to their coursework, all activities of Laban's students were communal and interconnected according to an anarchist concept known as "the integrated day," in which sharing in the interrelated action patterns of labor and culture fostered a more harmonious and organic wholeness of existence apart from modern society.[73] These communal undertakings included gardening, cooking, and shoemaking alongside expressive pursuits in more traditional media like painting, sculpture, and textile. Writers such as Hermann Hesse, James Joyce, Rilke, and D.H. Lawrence stayed there.

Laban's art school at Ascona reflected his philosophical-experimental paradigm of *Lebensreform* with four courses of study that each student pursued simultaneously: formal, acoustic, verbal, and movement. Anarchism offered Laban opportunities to rethink the relationship between art and labor that could never have succeeded in Hellerau, such as the careful balance of shared labor and expressive exercises that allowed his students to become a more closely knit group in the midst of broader productive means that they controlled and maintained. Laban incorporated into his overall program the broader anarchist practices of Ascona's overall philosophy of the integrated day as the best means to alter entirely one's cultural practices. He personally taught verbal art, which consisted of language instruction, vocal technique, and the

projection skills of theatrical oration, along with a separate course on movement art, which included dance and gymnastics [*Turnen*]. Conducting his courses on group expression in a commune fostered these efforts considerably.

This Leftist context also informed Laban's radical utilization of Wundt's physiological psychology, which anchored many of the dancer's theories of expression. As Laban biographer Evelyn Dörr has recently suggested that both the *Grundzüge* and the *Völkerpsychologie* gave Laban a full sense of "the psychophysiological unity of movement and of the 'healing power' of the focused application of movement techniques."[74] This healing power was, in fact, Laban's means to remold the subject's expressive and experiential nervous physiology by actively changing how his students moved as a group in space, which fomented the establishment of an anarchist *Völksgemeinschaft*—one that was modern, but more centered on human needs than the nationalist and capitalist models of Europe.[75] As the first press release of his school declared in 1913:

> The muscles, nerves, and brain are the three centers where desires, feelings, and knowledge manifest themselves. The great rhythmic laws that we clearly see in our emotions, movements, and thoughts, govern all these areas. Conscious observation of these processes allows ANYONE in his own time to recognize the rhythm of his life and to strengthen and command it.[76]

Overall, Laban sought to extend the individual's neurophysiological and ultimately his or her psychological capacities by molding the expressive motions of dance as one element of an overall reformatted practice pattern of everyday life. In a manner that connects him to Steiner's contemporaneous practices, Laban understood that the body was an

instrument that one had to modify neurally and then use expressively in coordination with others in a manner that would ultimately make culture into a site of social metamorphosis.

In his first major theoretical statement, *Die Welt des Tänzers* (1920), Laban synthesized over a decade of teaching experience. In its pages, he outlined the ways in which the supposed intellectual content of expression was initially a particular conglomeration of physiological movement processes that one could alter more directly through unconventional forms of ambulation. The ultimate consequences of this alteration would not be immediately clear, but Laban's reading of Wundt had convinced him that his pursuits were sound:

> In common parlance we situate "thinking" as equal with brain work and cerebration. But has not the origin and terminus of a given concatenation of exploration and closure been established in the physiological role of thought processes as clearly recorded movement processes in the nervous system and other organs in the body?[77]

Clearly fascinated with Wundt's ideas concerning the relationship between innervation and consciousness at both the individual and social levels, Laban reasoned that if the source of thought and expression was the nervous system, then one could change the nature of a group's intellectual outlook *and their social practices* by altering the body's nervous structure. For the dancer, all forms of expression were types of movement that had the nervous system as a common source of origin. In arguing that all forms of expression were movements, Laban used his knowledge of Wundt's theories to

drastically expand on Dalcroze's eurhythmics and modify Wundt's theories into an enabling structure of social reform.[78]

Every mode of expression was one facet of an overall movement art [*Bewegungskunst*], but a group had to work toward understanding how these modes could become interconnected in ways that could communicate particular ideas about essential truths of life and experience. In an anarchist context, a small group or subcollective of dancers would experience alterations of consciousness and patterns of expression if they initially became reoriented to basic movement patterns in space. Laban intended that his dancers would become the vanguard of a new social group that, like the Anthroposophists, performed heavily choreographed routines that he called "purpose plays," which communicated an idea by means of highly coordinated expressive gestures that would, he hoped, enlighten wartime society in a manner that would lead to social reform.[79] These highly orchestrated works have received substantial scholarly analysis, but the painstakingly contrived nature of these finished dance pieces began with preparatory endeavors known as free dances, which consisted of pure improvisation and cultivated discord. These exercises, which have not received a great deal of attention, indicate Laban's most extreme modifications of the Dalcroze method and Wundt's system of physiological psychology.

The Free Dance: Improvisation as Nervous Alteration

In Laban's free dance [*Freitanz*] practices, he used chance occurrences with an understanding that reactions to these experiences would alter the nervous platforms of thought by dissolving prior habits. Utilizing chance in this manner would, Laban

believed, awaken new senses of space in addition to new awareness of rhythms in space and the body. In her memoir, Mary Wigman recalled Laban's fascination with improvisation:

> In invoking our imagination by his own vivid fantasy, his instruction always turned into a lesson in improvisation, and as a final result into dance. Undoubtedly one of his strongest talents was his gift for improvisation. He was able to fashion a fascinating event out of a completely insignificant happening.[80]

These beginner lessons were deliberate cultivations of sensory and ambulatory discord. Students had to react, often in the nude, to a spontaneous cacophony of drums, gongs, tambourines, shouts, and flailing limbs in the open air. Every student also had the opportunity to perform both the instrumentalist and dancer roles in this collective experience/expression. In these exercises, Laban pushed his students to focus on discovering and interacting with sensations of spatial rhythm [*Raumrhythmisches Empfinden*] that appeared unexpectedly during their *Freitanz* exercises. A student could draw these new sensations from the vibratory energies of a space, other dancers, and him or herself (figs. 11-12). Laban's goal in his free dances was to build the capacity of his students to sense all the different kinds of rhythms within space and themselves.

Unlike Dalcroze's eurhythmics, Laban's goals of expression could not rely on previous formative techniques or rhythms. These constructions were traditional forms of body education and could not, he believed, necessarily transform individuals and collectives into vehicles of new expressive fullness, since pre-existent rhythm functioned within pre-ordained, bodily conventions. Realizing new experience required total sensory rearrangement, and Laban clearly approached chance, improvisation, and spontaneity in

these terms of immediate, but ultimately unknown, processes of nervous disruption and rearrangement.

Considering several quotations from *Die Welt des Tänzers* provides insight into the importance Laban placed on exercises and actions that, to an outsider, appear purely chaotic. Rather than immediately set his students to learning choreography, his reschooling was far more extensive and entirely within the catholic embrace of *Lebensreform* as a total modification of the body's habits. His students spent warm summer days on the hillsides of the commune relearning how to move their hands along with a whole regimen of other movements that reacquainted them with spatial bearing. As Laban described it,

> The most important and meaningful element of bodily movement is certainly spatial orientation [awareness of space and oneself in it]. Through the alteration of spatial orientation, the energy that bestows shape allows the body to appear sometime expanded, exalted, and then again bent, compressed. Countless forms attest the [existence of] countless levels of irritation, which the body follows in its gestures.[81]

Spatial orientation was a person's sense of becoming one element in motion with others in space as forms of energy. Laban taught his students that space had a rhythm and one had to learn the ways in which one's own rhythms of motion and expression were inextricable from these spatial conditions. No true artist could be a closed being. Embracing spontaneous forms of spatial bearing expanded upon the student's sense of the body in space, which directly increased his or her approach to the energies of the expressive body:

> The human body follows specific laws of spatial moderation in its movements. Every movement consists of multiple directional tensions, which hold each other in reciprocal balance. The spatial tendencies of these directionalities are related, as they more or less continuously run into each other.[82]

Beginning at this rudimentary level of total openness to new sensory and spatial stimuli increased the student's overall awareness of all the different neurophysiological building blocks of expressive rhythm and gave him or her a sense of the ways in which the body was connected to the rhythms of space.

Laban was unequivocal that the sources of all these new movements and expressive forms came from new processes of innervation:

> In simple terms, a tension represented in the central organ [cortex] of our nervous system, in the cerebrum, or, even more likely, still in the entire body, gives birth to a thought. Anatomical, physiological, and pathological studies have enlightened us about how certain parts of the cerebrum correspond to specific sense organs and thought complexes.[83]

Rhythms of space connected to the body and mind through the nervous system. Learning new energies of expression relied on exercises that altered the structures of innervation in a student's body. For a student of Laban, then, a gesture in a certain space was not simply a readymade thing absorbed from pre-existent cultural traditions as meaningful. Studying gesture, voice, and sound as interconnected neural processes enabled one to uncover "the wide range of textures and movement qualities hidden within the movement."[84]

Subsequent repetition of the movement over several hours in Laban's classes was instead meant to give one a layered sense of the complexities involved in the coordination

of subtle, heretofore unnoticed impulses and connections between the parts of the body and mind. In his free dance, Laban intended that his students would explore different ways in which body gestures changed interactions with environments in the dimension these gestures had as new nervous pulsations:

> The pulsations follow the spatial laws of eurhythmy. They thus do not pulsate randomly from one arbitrary ambit point to another, but instead follow laws of combination and sequence, which also determine the interwoven mental movements of spatial play. The attempt to regulate through eurhythmy the relationship between gravity lightness by means of ever-more intensified life appears as one of the most essential laws of gestural energy.[85]

The goal of the *Freitanz* was thus to awaken in the bodies and minds of the dancers new sensations of spatial rhythm, which would expand the bodily capacities of expressive strength in the movement arts of dance and performance. But for Laban, gesture included more than movements of the arms and legs. Following Wundt, he understood language as a form of gesture or bodily movement that nervous processes ultimately controlled—processes that could undergo modification.

Language as Bodily Movement

Language had a major place in these initial lessons. In addition to movement, language and vocalization was the only other course Laban taught continuously at Ascona. When Laban's students were participating in a *Freitanz*, they tried to encapsulate the emotional tonality of these raw movements with corresponding guttural yells individually, with a partner, and as a collective that moved in reaction to sudden gong

strikes by Laban. Dörr has described how Laban had his students "improvise with sounds and movements and carry out studies of subjects such as which movements produce which tones."[86] Rather than make movements in correspondence to pre-existent rhythm, or recite vocal exercises like *soflège*, students discovered how new movements instantaneously produced new tones, rhythm, and harmonies. Once again reversing the Dalcroze method, Laban encouraged his students to explore the ways in which new bodily movements could generate new tones and rhythm that they made with their own voices. This elemental trait did give the utterance a musical quality, but it was music of the body rather than for it. Laban understood language as one dimension of the body's nervous emanations, which meant that it contributed to new sensations of spatial rhythm.

Laban orchestrated his *Freitanz* in a manner that enabled students to incorporate a new sense of the potentials of language as a process connected to nervous conduction. Wundt's work had shown Laban that utterance was a bodily movement that was inextricable from other forms of motion that were initially more noticeable as ambulatory expressions, like the movements of arms and legs. In *Die Welt des Tänzers*, Laban's description of language as a sound gesture relied entirely on Wundt's theories of language as based in currents of neurophysiological conduction. In considering the harmonies of language, Laban was unequivocal in his belief that in any culture,

> the lips, tongue, and oral cavity ceaselessly form new gestures (*Gebärden*) – perform a dance. Breath creates a vibration of the surrounding air, which in our ear absorbs the image of the movement of the speaking organs as represented waves. Likewise the light waves of repeated movements of the entire body appear to our eyes.[87]

In approaching language as one element of expression, Laban conformed to both the notion of articulation as a gesture and the notion from the *Völkerpsychologie* that the perceived rhythms of language provided an overall sensibility for the psychophysical orientation of a group's mental life and expressive forms.

For Laban, linguistic expression, whether speaking or singing, was clearly a process of bodily motion controlled by the nervous system:

> The physiological act of forward and backward movements of the tongue, the broad and narrow movements of the lips, and all other forms of sound image movements like those of the thorax, the throat, and the mouth organs are themselves gestures, which means they are a harmony of muscle movements with an excitation of feeling and an impulse to understand.[88]

Laban's description of language as a pulsating dance of vocal organs is a poetic variation on Wundt's theory that language was a habitual system of articulatory movements [*Artikulationsbewegung*] that a certain group built out of sound gestures [*Lautgebärde*] in reaction to particular conditions of space, which consequently made it a system of nervous practices or habits.[89]

Wundt's theories of language and his overall structure of neurophysiological change provide significant clues for interpreting Laban's seemingly chaotic and diverse *Freitanz* exercises. In this spirit of exploring new potentialities for language, Laban often made up words or had students perform improvisational dances to formal language that contained a great number of vowels and vowel sounds. Dörr has argued that Laban felt the vowel was the most bodily of all linguistic vocalization, because prolonged utterance of it was the most tonal form of sound gesture [*Lautgebärde*] in space.[90] Yelling or

projecting vowel sounds into space were not the only forms of linguistic expression that a student had to correlate to movement. They also had to react to newly composed poetry—another kind of immediate action rather than response to traditional forms. Laban's students explored methods of bodily response to phrases or poems that he would conceive and recite on the spot during a lesson. Students often collaborated on this exercise and composed their own poems that they set to interpretive or responsive movements—i.e., systems of gestures that they had conceived by improvisation. Laban's students also took choral training, but these vocal exercises also differed considerably from a more traditional curriculum. Once his students had learned tonal scales, they then experimented with discovering which movements seemed to fit best with certain tones in relation to the feeling one sought to convey. At the level of the *Freitanz*, Laban's intent in having his students probe the nature of language had a particular goal of revitalizing the human body's long-forgotten openness to rhythm and the full expressive potential of collective bodily movement in space.

Laban's vocal experiments in his *Freitanz* exercises enabled students to focus on modifying the nervous tissues of expression by treating all expression as interrelated facets of bodily motion governed by processes of innervation. In these exercises, his students would come to learn how improvising with utterance altered the physiological bases of language as an articulatory movement and shifted its overall cultural value as a conveyer of meaning. Laban believed that true art could only come from a person whose sense of the body's potential as an expressive instrument was at its fullest possible level and the best way to achieve this knowledge was a cultivated discord in the *Freitanz*,

which dissolved prior practices and opened the student's senses to new forms of spatial knowledge.

A New Collective Built on Chance

Laban's *Freitanz* contained an extensive treatment of chance, improvisation, and spontaneity as modes of embodied stimuli—new currents and impulses that gradually wore away a student's habitually construed neurophysiological structures of experience, awareness, and expression. In this context, improvisation was a spatial form of chance that altered the body's action patterns and collective biorhythms. Rather than deskilling, chance provoked a heretofore-unrealized form of elemental neurophysiology as the basis of new expressive gesture. Laban used chance in a manner that isolated and amplified Wundt's techniques of arbitrary modification as practiced in his Leipzig lab—that is, the intent within Wundt's use of this practice to sow discord in a person's nervous substrate and probe thresholds of intensity in relation to responsive movements. Only in Laban's hands, in the form of chance or spontaneous occurrences in the *Freitanz*, arbitrary modification was the means to alter, rather than observe, habitual nervous processes. It was the means to build a new expressive body. The *Freitanz* exercises confirmed his belief that one had to first wear down practices before new formats of elemental action could prepare one for more complex alterations of consciousness that resulted from additional and more highly choreographed forms of movement.

In addition to generating a new feeling that the body and collective expression were intimately connected to the rhythms of space, these new experiences harkened back to an imagined moment of primal unity in which the body and the collective were more

intimately connected to the spatial rhythms of nature, which was a major value of the commune in which Laban worked. After the *Freitanz* had generated a newly composed but comparatively rudimentary nervous system that lacked complex reasoning apparatus, which would quickly rule out chance as a desired platform for the absorption of concepts, then the locus of art and feeling could grow from a zone that was far below the conceptual superstructure of reason as a guide for process.

Laban's awareness of Wundt's *Völkerpsychologie* strongly suggests that he used chance in a manner that drew on the psychologist's treatment of the notion as the main element of primitive habit formation. However, he altered its theoretical place from a naturally occurring stimulus into broad category of expressive forms that an artist could deliberately and repeatedly apply in a manner that would alter habitual nervous processes. Wundt made several connections between primitive culture and chance and presented the primitive subject as both more open to chance, due to his lack of pre-existent and comparatively higher cognitive forms like apperception. That lack made him/her more attuned to mobilizing the seeming illogicality of chance occurrence as instances of conjoined utility and supernatural causality. Chance sowed discord in the nervous substrate, but it was a very particular mode of discord that, based on Laban's awareness of Wundt's work, had an immediate connection to theorizations of what consciousness was like in primitive societies.

In the *Freitanz*, wearing down the habitual structures of innervation disrupted the continuities of higher experience and cognition. Contrary to Wundt's theory of chance, but in a manner that drew on it, Laban understood chance as the most conspicuous stimulus in the worldview of primitive consciousness, but utilized techniques of

improvisation in a manner that cultivated an associated primitive sensibility as a platform of consciousness and nervous structure that a group could build for itself out of new conductive processes of innervation. Spontaneous reactive motions in the *Freitanz* unfolded with an understanding that, at least at this rudimentary stage of preparation, chance could become a new sort of practice that cultivated a more primal form of group consciousness that was more palpably connected to the spatial rhythms of nature. Introducing exercises that relied heavily on chance shaped the nervous system into a more elemental structure, which Laban felt was essential to grasping the inherent qualities of spatial rhythm.

In order to better describe the harmonious relation between expressive motion and spatial rhythms he sought, Laban described the ways in which primitive drum language inspired his experimental studies of movement. Wundt's work had shown Laban the ways in which primitive societies experienced these various movement patterns of sound or gesture as interrelated. As he wrote in *Ein Leben fur den Tanz*, he was particularly fascinated by Wundt's argument that "primitive man can make himself understood equally well with audible or with visible gestures."[91] Laban described drum language in a manner that recalls Steiner's interest in Wundt's description of primitive gesture language as exemplifying non-verbal communication. For Laban, it was a form of expression that unified rhythms of the body and space as a nexus of word, tone, and internal conductive processes of the nerves. As he understood it, "to primitive man the language of the drum seems nothing other than the rhythm of his body made audible."[92] Drum language was a more overtly gestural or tactile form of language that spatialized the life rhythms of the group. It confirmed Laban's belief that all expression was a

nervous emanation, to the extent that it broke the hidebound distinction between self, other, and space, and immediately connected the life rhythms of these three entities in a more palpable way. As he had written earlier in *Die Welt des Tänzers*, primitive art also exemplified this social and spatial capacity:

> What strikes us about the forms of early handmade art and the artifacts of people and races living simply? One says it is primitive. This is incorrect. It is the humanity, the expressive richness of the artifacts. One sees: this object is used in a sense natural to life. We desire to see and sense rhythm.[93]

This form of social harmony in expression and communicative knowing relied on a certain common structure of innervation that Laban worked to cultivate in his dance troupe and new practices of "living simply" in the commune at Ascona. Rather than being inspired by primitive *dance*, Laban sought to develop a program of expressive gestures of body and voice that would exude the same rhythmic-spatial quality of drum language: "To be able to perceive the pathway of a gesture and in its flow the gift of vital tension" became his pedagogical and expressive goal.[94] Creating a spatial harmony through expressive gestures required forming one's nervous pathways in a manner that engendered a more intense overall sensation of rhythmic space and one's place within it as part of a group.

To be sure, Laban's interest in drum language and primitive society as a whole was a metaphor of a harmonious anarchist community living apart from modern urban society. "Primitive" for Laban meant a group that was more sensitive to the rhythms of space and the needs of each other. For him, primitives were not less developed, but had developed differently than those in urban society, to the extent that communicative

expression effaced common distinctions (and corresponding, compartmentalized action patterns) between language, sound, perception, and movement through space. What Wundt had understood as a lack of individuality, Laban understood as an ideal form of social harmony between people and nature. These allegedly normal boundaries between self, other, and space were, in primitive society, fused as subtle variants of the same structure of biorhythmic vibrations, which the innervation processes of expressive movement encapsulated. As inspiration for a reformist model, primitive culture showed Laban that one had to develop a format of action platforms that displayed a more unified coordination between members of the group and with respect to the space in which the group lived.

Laban's goal was not to reenact this drum language, but to live through expressive motion in an analogical fashion and as part of a broader system of life practices that comprised the integrated day, which was an overall attempt to reharmonize a social collective outside the models of modern Europe. He lauded primitive society as indicating potential sensory platforms that could offer heightened experience by becoming more unified and polyvalent. He sought a similar neurophysiological level of heightened expressive capacity. Coordination of bodily movement rhythms was the key enabling factor. In order to expedite this process of reformation, one had to modify the structure of the nervous system.

Laban sought for his *Freitanz* to trigger the initial stages of this process of sensory and social reformation. "Primitive" could be appreciation of things African, but it did not have to look or sound African. A deeper sense of primitivism simply connotes a more rudimentary physiological platform in which rhythmic patterns of the senses overlapped

more clearly with each other and with the biorhythms of a certain space, as in Laban's example of drum language. This mode of primitivism was a goal that a group had to reach through new movements that created a greater sense of spatial bearing as the basis of heightened expressive capacity:

> Spatial Arrangement in the work of movement art: Today the course of development is already sketched clearly. There are at least some dances, scenes, and first starts, both on the stage as well as in photographs, which are spiritually gripping because of their language of forms. . In this, the concept of space, and thus also spatial arrangement play a meaningful role. The more simply, clearly, and more meaningfully they frame and support the actual play of forms, the conflict of tension of representational movements, the more insistently we will be gripped by them. Famous artists are taking up the task of shaping this frame as poets of form.[95]

Laban's ambition was to forge this elementalism of primal, multisensory communicative rhythm by moving within the creation of the work as part of a collective.

Overall, then, Laban sought to refashion an elemental *Kunstwollen* far below the sequential continuity of the rational cognitive and emotive process fuelled by normative functions of higher intellectual structure—by reacquainting one with the rawest levels of its bodily substrate. He was not trying to *recreate* earlier oneness with nature (real or imagined facts of primitive lives), but rather to compel groups, in the present, to reforge their psychophysical relationships to space through movements that they invented or recovered from other times and places.

The subject would not project selfhood, but would connect to new biorhythmic frequencies of a group, like beads of mercury forming a pool. This refashioned group would then communicate its new rhythms of expressive energy to the audience with the expressed intention of communicating new forms of bodily and mental awareness to the spectators that would awaken them to higher forms of consciousness. This awakening would, Laban believed, be based on newly shared rhythms that indicated the beginnings of common nervous conductions as foundaitons of the newly constituted *Volksgeist*. His ambition was to create an ever-expanding community apart from the Modern state, which experienced new forms of collective experience and consciousness. Artist and audience would come together by living through new rhythms that the dancers conveyed.

In a manner that recalls the contradiction previously located within Dalcroze's two separate notions of normalcy—one flawed, the other refashioned—one finds a contradiction between two different modes of neurophysiological refashioning in Laban's overall pedagogical method. On the one hand, his students were awash in new spatial rhythms during the free dance, which relied on a continual use of chance to disrupt and soften previously constituted conductive structures. On the other hand, as the end product of this process, the group performed a finished purpose play that was heavily orchestrated, obsessively rehearsed, and very formalized (fig. 13). The dance group had reshaped their nervous systems outside the space of performance and had created new practices and habits of expressive conveyance that Laban tightly controlled. The group's expression unfolded in service of a particular, pre-conceived goal idea that formed the conceptual heart of the purpose play. What began as baseline disruption became the initial means of gradual, ascendant reconstitution. The nature of this reconstitution was

more involved, because Laban embraced the entirety of physical expression as movement, but also worked diligently to shape all modes of this entirety into the foundations of an expressive genre that was metaphysically liberating in tone but ultimately restrictive in its intentions. Thus both Laban and Dalcroze embraced the notion that conduction paths in the nervous system were not fixed, but they went counter to the notion in their attempts to formalize expressive techniques that they had gradually built from a perceived chaos of psychosocial orientation.

In his own way, each of these figures expressed a general notion that the physiological bases of thought were mutable and that one changed these bases by undertaking new forms of movement involving gestures of limbs, voice, instrumentation, or percussion. Laban was most expansive in his framing of the body's expressive capacities as different forms of neurophysiologically connected gestures. This approach to the body encouraged artists to consider a deeper coordination between different forms of expression by viewing these forms as consecutive dimensions of nervous energy. In contrast to his finished pieces and considered in isolation, Laban's free dance couched an essence of amplified neurophysiological change that one may consider apart from his more finished works and overall philosophy of decidedly conservative *Lebensreform*. While Laban inhabited and then departed from this context of dynamism, Dadaists in Zürich took this category as their ultimate base of operations.

[1] Dalcroze, "Music, Joy, and the School," in *Rhythm, Music, and Education* trans. Harold F. Rubinstein (New York and London: G.P. Putnam's Sons and Knickerbocker Press, 1921), 180.

[2] For more on the broader movement of *Lebensreform* from its beginnings in the 1820s to the present, see *Die Lebensreform. Entwürfe zur Neugestaltung von Leben und Kunst um 1900.* Herausgegeben von Kai Buchholz, Rita Latocha, Hilke Peckmann und Klaus Wolbert. Katalog zur Ausstellung im Institut Mathildenhöhe Darmstadt. Darmstadt 2001); Eva Barlösius: *Naturgemäße Lebensführung. Zur Geschichte der Lebensreform um die Jahrhundertwende*. Frankfurt/M., New York 1997); Wolfgang R. Krabbe: *Gesellschaftsveränderung durch Lebensreform. Strukturmerkmale einer sozialreformerischen Bewegung im Deutschland der Industrialisierungsperiode*, Göttingen 1974); Judith Baumgartner und Bernd Wedemeyer-Kolwe: *Aufbrüche, Seitenpfade, Abwege. Suchbewegungen und Subkulturen im 20. Jahrhundert. Festschrift für Ulrich Linse*. Würzburg 2004.

[3] Dalcroze, "Rhythm as a Factor in Education," in *The Eurhyhmics of Jaques-Dalcroze*, trans. Percy and Ethel Ingham (Boston: Small, Maynard, and Company, 1918), 14.

[4] I address secondary literature on this matter in more depth below, but briefly outlining the historical context of Dalcroze's mature career can help situate him and his method at the outset of the study.

[5] See for example Frederic J. Schwartz, *The Werkbund : Design Theory and Mass Culture before the First World War*, (New Haven: Yale University Press, 1996).

[6] Dalcroze was initially reluctant to leave Geneva with his family, but Dohrn's promise of unlimited resources was impossible to resist.

[7] Dohrn died in a freak skiing accident in February 1914. Switzerland was neutral, but when Dalcroze signed a petition with other Swiss cultural figures protesting the German bombing of Reims Cathedral in Louvain, he became a veritable enemy of the state. Repeated attacks on him in the German press encouraged his return to Geneva. Without Dohrn to help defend him, all seemed at a loss.

[8] Dalcroze, "The School, Music, and Joy," *Rhythm, Music, and Education* (1921), revised and expanded edition, trans. Harold F. Rubinstein (Woking: Dalcroze Society and London: Riverside Press, 1967), 95-96. Further citations are to this edition unless otherwise noted. In another essay, "Rhythm and Creative Education" of 1916, Dalcroze emphasized this aspect of continuity in his statement that rhythm "requires the consonance of each of its subdivisions to enable it to retain its power of animating a continuously harmonized movement." Dalcroze, "Rhythm and Creative Education," in *Rhythm, Music and Education*, 107.

[9] Dalcroze, "Rhythm, Movement, *Soflège*, and Improvisation," in *Rhythm, Music, and Education* (1921), revised and expanded edition, trans. Harold F. Rubinstein (Woking: Dalcroze Society and London: Riverside Press, 1967), 63. *Soflège* are rudimentary vocal exercises in sung tone (do, re, mi, etc.).

[10] Dalcroze, "The Initiation into Rhythm," in *Rhythm, Music, and Education*, 36.

[11] Dalcroze, "Music and the Child," *Rhythm, Music, and Education*, 52. As Dalcroze emphasized in "Rhythm as a Factor in Education (1909)," awareness of rhythm "depends equally upon the training of the nerve-centers, upon the coordination of the muscular system, upon rapid communication between brains and limbs—in a word, upon the health of the whole organism." Dalcroze, "Rhythm as a Factor in Education," in *The Eurhyhmics of Jaques-Dalcroze*, trans. Percy and Ethel Ingham (Boston: Small, Maynard, and Company, 1918), 15.

[12] Dalcroze, "The Place of Ear Training in Musical Education" in *Rhythm, Music, and Education*, 4.

[13] Dalcroze, "Rhythm as a Factor in Education," in *The Eurhyhmics of Jaques-Dalcroze*, trans. Percy and Ethel Ingham (Boston: Small, Maynard, and Company, 1918), 16.

[14] Michael Cowan, *Cult of the Will: Nervousness and German Modernity* (University Park: Pennsylvania Statue University Press, 2008), 181. Cowan offers an alternate reading of Dalcroze's work as part of a broader focus in controlling the will of subjects. My approach looks in more depth at the ways in which Dalcroze's attention to innervation created a basic structure from which more radical users of eurhythmics departed—i.e., figures who adopted eurhythmics outside the context of the *Werkbund*. Scholars of twentieth-century art know Flournoy's name from his studies of mediums in his work *From India to the Planet Mars* (1899), which was a major source of interest for Surrealist artists. For a very informative recent study of Flournoy's career, see Serge Nicolas and Agnes Charvillat, "Theodore Flournoy (1854-1920) and Experimental Psychology: Historical Note," *American Journal of Psychology* 111 no. 2 (Summer 1998): 279-294. Claparède was a major figure in the burgeoning study of nervous disorders among French speaking psychologists and would eventually translate Freud's work into French, all of which testifies to his interest in diverse psychological theories.

[15] Claparède began his career by studying nervous disorders like hemiplegia (paralysis on one half of the body) and hemiataxia (uncontrollable movement on one half of the body). This text was based on the dissertation of the same name written for Flournoy. These issues of paralysis and uncontrollable movement also appear in many studies from the period on neurasthenia and hysteria, as in Freud's early studies of the subject with Breuer. It therefore makes sense that

Claparède was a translator of Freud's work in to French. Dalcroze himself believed that his method could help cure neurasthenia, but his main focus was always training more ostensibly healthy subjects, rather than psychotherapy.

[16] Edouard Claparède, *Du Sens Musculaire a propos de quelques cas d'Hemiataxie posthemiplegique* (Geneva: Charles Eggimann and Co., 1897), 29.

[17] "*Arrivons sans plus tarder à Wundt qui est la représentant actuel de la théorie centrale qu'il a lui-même précisée et mise en vogue. Il pense que ces sensations du mouvement ont pour siège les cellules nerveuses motrices, qu'elles sont liées a l'innervation motrice. Il les appelle donc <<sensations d'innervation>>* [Innervationsempfindungen]." (Claparède, Ibid., 29-30).

[18] "*La place du quatrieme schème comme dernier stade de l'évolution est justifée par ce fait que certains mouvements exécutés souvent (la marche, le piano, etc.) bien que primitivement volontaires, deviennent automatiques avec l'exercice*." (Claparède, Ibid, 61). It helps to recall at this juncture that Dalcroze relied on Wundt's notion that positive emotions attached to movements and gestures that were habitual. In line with the conservation of energy in the nervous system, any practice that did not involve a conspicuous exertion of effort became pleasurable. As automatic, one could become detached form it and look upon the exertion of motion as positive.

[19] Dalcroze, "The Place of Ear Training in Musical Education" in *Rhythm, Music, and Education*, 4.

[20] The practice of bodily movements awakens images in the mind. The stronger the muscular sensations, the clearer and more precise the images, and thereby the more metrical and rhythmic feeling is developed; for feeling is born of sensation . . . The precision and regulated dynamic force of muscular automatisms are a guarantee of the precision of thought automatisms, and the regular development of imaginative faculties." Ibid, 125. Realizing these potentials required training the nervous system according to a new pedagogy that could foster the desired growth and intensification of nerves in the manner Dalcroze believed was appropriate to proper musical expression. As early as his 1898 essay on "The Place of Ear Training in Musical Education," Dalcroze declared that his *Turnen* exercises were dedicated entirely to altering the nervous system and opening up clearer channels of innervation: would, according to Dalcroze, "open up between brain, ear, and larynx the necessary channels to form of the entire organism what one might call the *inner ear*." Dalcroze, "The Place of Ear Training in Musical Education" in *Rhythm, Music, and Education*, 2. Rhythm would live in the self, but the physiological bases of that self had to change in the process of this absorption. At a lecture in London that he gave on February 25, 1916, Dalcroze argued that only in this way could the body "become an instrument of art, and

this it will only do by means of special training, having as its object the suppression of resistances, both intellectual and physical, which prevent the individual from expressing himself according to his personal rhythm."Dalcroze, from lecture given in London, February 25, 1916, repr. and trans. in *The Eurhythmics of Jaques-Dalcroze*, 34. As Dalcroze stressed in "The Initiation into Rhythm," "Consciousness of sound can only be acquired by reiterated experiences of the ear and voice; consciousness of rhythm by reiterated experiences of movements of the whole body." Dalcroze, "The Initiation into Rhythm," in *Rhythm, Music, and Education*, 37. In these statements, Dalcroze was unequivocal in his tenet that training students in rhythm worked better if they increased the quantity of innervation in their training exercises.

[21] Claparède, Ibid, 61.

[22] Dalcroze, "Music, Joy, and the School," *Rhythm, Music, and Education* (1967), 95-96.

[23] Dalcroze, "The Place of Ear Training in Musical Education" in *Rhythm, Music, and Education*, 3

[24] Dalcroze, "Rhythm as a Factor in Education," in *The Eurhyhmics of Jaques-Dalcroze,* 16. Likewise, from the same essay, he felt that he had formed his method "naturally and gradually as the result of observation and experiment." Ibid, 34.

[25] Ibid., 16.

[26] Dalcroze, "Rhythmic Movement, Soflege, Improvisation," in *Rhythm, Music, and Education* trans. Harold F. Rubinstein (New York and London: G.P. Putnam's Sons and Knickerbocker Press, 1921), 122.

[27] Ibid.

[28] Dalcroze, "Rhythmic Movement, Soflege, Improvisation," in *Rhythm, Music, and Education* trans. Harold F. Rubinstein (New York and London: G.P. Putnam's Sons and Knickerbocker Press, 1921), 122.

[29] Dalcroze, "The Place of Ear Training in Musical Education" in *Rhythm, Music, and Education*, 2.

[30] Jahn inspired variations on the model throughout Europe and the United States that couched similar motivations of nationalism and hygiene. For a useful summary of Jahn in English see Harold B. Segel, *Body Ascendant: Modernism and the Physical Imperative* (Baltimore and London: Johns Hopkins University Press, 1998), 209-213. Segel is absolutely correct to associate the Boy Scouts movement of Baden-Powell in England to this overall trend. Standard source in English for a basic biography of Jahn is Horst Überhorst, *Friedrich Ludwig Jahn and His Time, 1778-1852*, trans. Timothy Nevill (Munich and Baltimore: Moos, 1982). For the rampant

popularity of physical culture in Europe, see the excellent volume *Art, Sex, and Eugenics: Corpus Delecti*, ed. Fae Brauer and Anthea Callen (Aldershot and Burlington: Ashgate, 2008). Other sources on physical culture in Germany include Cowan, *Cult of the Will*; Karl Toepfer, *Empire of Ecstasy: Nudity and Movement in German Body Culture, 1910-1935* (Berkeley: University of California Press, 1997); Bernd Wedemeyer-Kolwe, *"Der neue Mensch": Korperkultur im Kaiserreich und in der Weimarer Republik* (Wurzburg: Konighausen and Neumann, 2004); Chad Ross, "Building a Better Body: Nudism, Society, and the German Nation" (PhD Dissertation, University of Missouri Columbia, 2003). Brauer is the best of these scholars at distinguishing the particularly French attraction to calisthenics as part of a movement in fostering the rational procreation of the French people.

[31] Dalcroze argued that "a whole series of graduated exercises" built gradually increasing complexities in the tissues. The student trained in patterns of action in order to "adapt different muscular processes for short and long durations respectively, to estimate durations according to the sensations of tension and extension of muscles, of opening and closing of limbs in space, to coordinate the different dynamic forces of the body, and to apply the measure of space to the control of the duration and intensity of muscular contractions." Dalcroze, "Rhythmic Movement, Soflege, Improvisation," in *Rhythm, Music, and Education* trans. Harold F. Rubinstein (New York and London: G.P. Putnam's Sons and Knickerbocker Press, 1921), 123-124.

[32] Dalcroze, "Rhythmic Movement, Soflege, Improvisation," in *Rhythm, Music, and Education* trans. Harold F. Rubinstein (New York and London: G.P. Putnam's Sons and Knickerbocker Press, 1921), 128

[33] Dalcroze believed were "facilitated by the cultivation of automatisms . . . An arm will execute a rhythm automatically, while the mind regulates the execution of a second rhythm by another limb." Ibid, 129.

[34] Dalcroze, "Rhythm as a Factor in Education," in *The Eurhythmics of Jaques-Dalcroze*, 20. This aesthetics of regularity appeared in the context of physical culture, but it did not have the level of immediate applicability to the nature of gestures a person made in contexts of artmaking that it did in the eurhythmics of Dalcroze. Collapsing his work entirely into physical culture effaces this crucial distinction.

[35] The primary focus of this dissertation prevents a fuller discussion of these figures, but ongoing research apart from it has established usages of Dalcroze in France. One of the most radical applications of Dalcroze eurhythmics occurred in the works of the Ballets Russes from 1912-1914. Sergei Diaghilev, the troupe's legendary director, first witnessed a demonstration of the

Dalcroze method in St. Petersburg in January 1911. In February and December of 1912, Diaghilev took his principal dancer Vaslav Nijinski and his sister Bronislava to Hellerau. Richard Buckle, Diaghilev, (New York: Atheneum, 1979), 216, 238. Dalcroze was courteous to their interests, but he had no interest himself in teaching dancers. Bronislava Nijinska, *Early Memoirs*, 454. Buckle, *Diaghilev* (New York: Atheneum, 1979), 238-239. He offered to send one of his best instructors, the former ballet dancer Maria Rambert, with Diaghilev and Nijinski as an assistant choreographer for upcoming performances of Claude Debussy's *Le Jeux* and the ballet to Igor Stravinsky's *Le Sacre du Printemps*.

Nijinsky strongly believed that eurhythmics could foster a more potent expressive orientation to Stravinsky's raucous score, but his troupe was suspicious of the method and his overall ambition of altering the appearance of ballet choreography. He and Rambert began work on the routine during December 1912 and Nijinsky's obsession with altering the nature of dance led to over 120 rehearsals. Boris Kochno, *Diaghilev and the Ballets Russes*, trans. Arienne Foulke, (New York and Evanston: Harper and Row, 1970), 88. Rambert was at his side for the majority of these exercises and often worked with individual dancers as a way to better acquaint them with the specific requirements of the overall routine "Every day, after the general rehearsal, I had to stay for an hour or two and listen with Nijinsky to the score of *Sacre*. He then sketched out the movements for the next rehearsal. The rhythms were very diffcult, and I had to study the rhythm with each artist individually. They soon nicknamed me 'Rhythmichka.' There was no melody to hold on to—so the only way to learn it was to count the bars all the time. The movements in themselves were simple, and so was the floor pattern. But the basic position was difficult to sustain in movement, and the mastering of that rhythm almost impossible." Marie Rambert, *Quicksilver: The Autobiography of Marie Rambert*, (London: Macmillan, 1972), 56-57. Stravinsky's appearance at the rehearsal made things more difficult still: "When Stravinsky first came to one of our rehearsals and heard the way his music was being played, he blazed up, pushed aside the fat German pianist, nicknamed 'Kolossal' by Diaghilev, and proceeded to play twice as fast as we had been doing it, and twice as fast as we could possibly dance. He stamped his feet on the floor and banged his fists on the piano and sang and shouted, all to give us an impression of the rhythms of the music and the colour of the orchestra." Ibid, 58-59.

[36] Dalcroze, "Rhythm as a Factor in Education," in *The Eurhythmics of Jaques-Dalcroze*, 32.

[37] Equally important was developing an economy of innervation through an elimination of unnecessary inhibiting psychological factors that had become constituted in a person's nervous system as a result of habits in everyday life. Organic refashioning brought laws of

thermodynamics, such as the conservation of work or energy, to bear on the production of culture. Given the context of Dalcroze's Institute at Hellerau, scholars have established a Taylorist subtext to eurhythmics as it occurred while Dalcroze was in Germany.

[38] For example, Michael Cowan has argued that eurhythmics had the overarching intention to "provide an education of the will through music and dance" and cogently argues that Dalcroze sought to essentially rebuild the thinking, moving, and expressive body by gradually recomposing a relationship between Wundt's concepts of automatic instinctual acts [*Triebhandlung*] and complex acts of decision [*Wahlhandlung*]. Cowan, *Cult of the Will*, 180.Cowan is also correct to connect Dalcroze's overall project to the Helmholtzian law of conserved energy that also appears in Wundt's theories, "whereby complex decisions repeatedly performed revert to second degree instincts so as to reduce the expenditure of attention and psychic energy and make room for other conscious acts of will" (Ibid.) This model of efficiency had immediate social applicability. In the broader context of physical culture, group calisthenics at this moment were one means of increasing a person's productive efficiency in contexts of industry. Ibid, 184. Echoing the earlier arguments of dance scholar Susan Manning, Cowan has emphasized the fact that Dalcroze embraced the *Deutscher Werkbund*'s hope to improve production by reforming spatial conditions of formal rhythm in a way that facilitated efficiency. In this context, manipulating the human nervous system could increase production. The *Werkbund* believed that Dalcroze's methods reintroduced students to rhythm that thus made them feel less alienated from machine age production, which returned a sense of control to interaction with mechanized production, thus raising output. These assessments cannot explain the popularity of eurhythmics with people who used his theories apart from his belief structure. Comprehending this separate dimension of usability requires an altered view of physiological psychology that is outside the positivist French model and its unilateral model of volition on which Cowan has focused his critical reading of Dalcroze. Cowan connects Dalcroze methods to Ribot's studies on the will, which established supposedly standardized models of higher mental function. Ribot's work relied on the earlier theories of habit and practice that Wundt had first developed. Cowan stresses that Dalcroze's knowledge of psychology motivated his efforts to train students to master their will through psychomotor training, or exercises of movement that would help regulate higher mental operation in the context of expression. For example, Wundt's *Völkerpsychologie*—known to both Dalcroze and Claparède—shattered any singular transition from instinct to will in its outline of how certain models of higher intellect like volition and its bases in the movement patterns of a group rely far more heavily on specific contextual conditions and a shared neurophysiological level that vary

drastically from place to place. Dalcroze's work is itself a push in that direction toward using the science of shifting nerves as the bases for varying ascendant models of group consciousness. Other figures who knew Wundt's work on culture saw a space for alternative models. Thus, in contrast to Dalcroze's particular shaping of *Triebhandlung* into *Wahlhandlung*, other users of eurhythmics embraced the *Völkerpsychologie* as proof that other trajectories could exist.

[39] The most substantial intellectual biography of Steiner that makes the rare avoidance of falling into encomia is Perry Myers, "The Double Edged Sword: The Cult of Bildung, its Downfall and Reconsitution in *fin-de-siècle* Germany," (PhD Dissertation, University of Texas, Austin, 2002). Myers examines Steiner's broader historical and political context in relationship to the German cultural phenomenon of *Bildungsideal*, in which *Lebensreform* was one dimension.

[40] Steiner was originally a devotee of Theosophy, having first made contact with the overall doctrine in the 1880s and 1890s in the circle of the feminist Marie Lang. Corinna Treitel, *A Science for the Soul: Occultism and the German Modern*, (Baltimore: Johns Hopkins University Press, 2004), 98-99. Steiner became known for his strong intellect and ability to synthesize occult ideas into other discourses, which was a major value of these esoteric circles.

[41] For more on Blavatsky and her Theosophical Society in general see Alex Owen, *The Place of Enchantment: British Occultism and the Culture of the Modern*, (Chicago and London: University of Chicago Press, 2004), 30-37. For Blavatsky's relation to the interests of the European artistic avant-garde, see Maurice Tuchman et al, *The Spiritual in Art: Abstract Painting 1890-1985*, exh. cat (Los Angeles County Museum of Art, 1986), esp. 388-389. She first outlined this supposed wisdom in *Isis Unveiled* (1877). Blavatsky essentially argued within a synthetic, comparative religious framework that most major religions fell within a developmental trajectory of world consciousness and within this development, each person or "monad" evolved through seven different "root races" and thus lived through seven different bodies.

[42] Their 1901 book *Thought Forms* became a standard text on visualizing higher knowledge, clairvoyance, and thought transference, which continued the occult interest in combining science and metaphysics into philosophical programs underlying the search for higher forms of consciousness.

[43] Heiner Ullrich, *Rudolf Steiner*, trans. Janet Duke and David Balestrini, (London and New York: Continuum, 2008), 20-23. Along with Myers' work, Ullrich's book is one of the rare studies of Steiner's life and thought that does not fall into hagiography. A broader study of the ways in which occultist figures drew on science in general is sorely needed. Henderson's work on the usages of ether physics by occultist figures is a paragon of a genre of study—i.e., the

interrelationships of science and occultism in the context of Modernism—that needs attention. For more on these matters see in particular *The Fourth Dimension and Non-Euclidean Geometry in Modern Art* (Princeton: Princeton University Press, 1983; forthcoming re-edition, 2010); Henderson, "Vibratory Modernism: Boccioni, Kupka, and the Ether of Space," *From Energy to Information: Representation in Science and Technology, Art, and Literature*, ed. Henderson and Hunt (Stanford: Stanford Universty Press, 2002), 126-149. For more on the place of the ether in the broader context of the history of science, see Bruce Hunt's essay in the same volume, "Lines of Force, Swirls of Ether," Ibid., 99-113.

[44] Steiner rejected the claim from Besant that a fifteen-year-old Indian boy, Jidda Krishnamurti, was a reincarnation of Christ and the future world savior. When Besant founded a new order of adherents dedicated to the boy, known as the Star of the East, Steiner refused to admit these members entry to the Theosophical chapter in Berlin. This move caused Besant to expel Germany from the International Theosophical Society. Ullrich, Ibid, 26-27.

[45] While Wundt tried to explain different forms of mystical or occultist practice as arising from a collective physiology in a group, many branches of occultism and mysticism saw a continuity rather than a diversity in these different practices. They believed a synthesis of shared truths between these separate outlooks could be reached if one followed varying series of meditation or concentration exercises in newly forged ritual contexts and consciousness centers. As Alex Owen has forcefully argued, all of these branches saw their investigations into the mysteries of nature as a form of scientific inquiry that was not separate from metaphysical forays focused on the evolution of consciousness and the experience of supersensory phenomena. As Owen states, "For Victorian occultists, science and metaphysics were one and the same and found expression in the ancient wisdom. They used phrases like 'occult philosophy' and 'occult science' conterminously, and when they spoke of the latter they were referring not only to a science dedicated to knowledge of natural law but also the 'true' constitution of the human entity and the Absolute" (Ibid, 37). No one rejected science outright, *merely its underlying positivist philosophy*, because occult figures saw this rejection as merely being the other side of a narrow-minded rejection of epistemological alterity that the scientific rejection of possible occult or spiritualist endeavors exemplified. As has been well documented, many figures on both the occult and scientific sides of the debate studied each other, sometimes in collaboration, throughout Europe during the fin-de-siècle and well into the twentieth-century.

[46] According to Myers, "Steiner believed that there is an accommodative unity between the spiritual and physical worlds. The failure of modern science was not in the science; it lay only in

its rejection of spiritual 'reality,' not in its methods or discoveries as they pertained to the physical world." Myers, Ibid, 168-169. See also Robert Sumser, "Rational Occultism in fin-de-siecle Germany: Rudolf Steiner's Modernism," *History of European Ideas* 18 (1994): 479-511.

[47] Given the fact that Steiner composed well over 300 volumes during his lifetime, this discussion will limit itself to the ways in which he incorporated Wundt's ideas into his work in order to meet several broader goals. First, he wanted to make occult knowledge a collective undertaking for all members of society, in contrast to viewing the doctrine as a secret form of knowledge. Second, he sought to localize a notion of the occult as something particularly cognitivist as a higher form of knowledge, in line with Robert Galbreath's definition of occultism as having to do with "matters that are said to be intrinsically hidden from ordinary cognition and understanding, but that are none the less knowable through the awakening of latent cognitive faculties of appropriate sensibility." (Galbreath, "Occult," in Tuchman et al, *Spiritual in Art*, 380. See also Galbreath, "The History of Modern Occultism: A Bibliographical Survey," in Galbreath, *The Occult: Studies and Evaluations* (Bowling Green: Bowling Green Popular Press, 1972), 98-126.

[48] Rudolf Steiner, *The Spiritual Hierarchies and the Physical World: Reality and Illusion* (1909), trans. R.M. Querido, (Hudson, NY: Anthroposophic Press, 1996), 171.

[49] Steiner, *The Soul of the People Considered in the Light of Spiritual Sciences* (1914), trans. unknown, (Whitefish, MT: Kessinger Publishing, 1998), 4. Emphasis is mine.

[50] Steiner, Ibid, 5.

[51] This phrase occurs as part of a lengthy quote, again addressing Wundt, from 1919: "Psychologists of today are puzzled to know whether to keep the principles of the soul completely apart or let them intermingle. Some psychologists are haunted by the old, strict differentiation between will, feeling, and thought; in others, e.g. in the more Herbartian psychologists, everything is directed more to the side of the mental picture, while in the followers of Wundt it goes more to the side of the will. They have no true conception of how to deal with the membering of the soul. This is because in actual practical life the ego really permeates all capacities of the soul." Steiner, "Lecture Three," in *Study of Man: General Education Course* (1919), trans. Daphne Harwood and Helen Fox (London: Rudolf Steiner Press, 2004), 62.

[52] Steiner, *An Outline of Occult Science* (1909), 4th ed., trans. Maud and Henry Monges (Chicago: Anthroposophical Literature Concern, 1922), 323.

[53] Steiner, Ibid, 323-324.

[54] Steiner, "A Lecture on Eurhythmy (1923)" in *Eurhythmy: An Introductory Reader*, ed. Bethany Usher (London: Sophia Books, 2007), 63

[55] The notion of the etheric body was most extensively outlined by C.W. Leadbeater in his 1899 text *Clairvoyance*. "We know," Leadbeater wrote, "that each man possesses an astral and a mental body, each of which can in process of time be aroused into activity, and will respond in turn to the vibrations of the matter of its own plane, thus opening up before the Ego, as he learns to function through these vehicles, two entirely new and far wider worlds of knowledge and power." (Leadbeater, *Clairvoyance* (1899), 1918 edition (London: Theosophical Publishing Society, 1918), 12). These new worlds were not unconnected, but, rather, were "subdivided so very much more finely and vibrating so very much more rapidly as to introduce us to wha tare practically entirely new conditions and qualities" (Ibid).

[56] For a nice summary see Ullrich, *Rudolf Steiner*, 253.

[57] Rudolf Steiner, *Knowledge of the Higher Worlds and Its Attainment* (1904), (Forgotten Books, 2008), 79, http://forgottenbooks.org/ info/9781605064864 (accessed November 11, 2009).

[58] Steiner, Ibid.

[59] In *Clairvoyance*, Leadbeater had outlined this notion as well: "It is not then difficult for us to grasp the possibility of a steady and progressive extension of our senses, so that both by sight and by hearing we may be able to appreciate vibrations far higher and far lower than those which are ordinarily recognized. A large section of these additional vibrations will still belong to the physical plane, and will merely enable us to obtain impressions from the etheric part of that plane, which is at present as a closed book to us. Such impressions will still be received through the retina of the eye; of course they will affect its etheric rather than its solid matter, but we may nevertheless regard them as still appealing only to an organ specialized to receive them, and not to the whole surface of the etheric body." (Leadbeater, *Clairvoyance*, 12-13).

[60] Steiner, "Lecture on Eurhythmy," 64.

[61] Steiner, *Knowledge of the Higher Worlds*, 81.

[62] Leadbeater was also interested in making the nervous system and its structures of change into the bases of an evolution in consciousness. As he described (rather verbosely) in his 1902 text Man Visible and Invisible, "We must think of the man as creating these vehicles for himself in the course of his future evolution, for every man possesses them from the beginning, though he is by no means conscious of their existence. We are constantly using to a certain extent this higher matter within ourselves, even though it be unconsciously. Every time that we think, we set in motion the mental matter within us, and a thought is clearly visible to a clairvoyant as a vibration in that matter, set up first of all within the man, and then affecting matter of the same degree of intensity in the world around him. But before this thought can be effective on that physical plane

it has to be transferred from that mental matter into astral matter; and when it has excited similar vibrations in that, the astral matter in its turn affects the etheric matter, creating sympathetic vibrations in it, and that in turn acts upon the denser physical matter, the grey matter of the brain.

"So every time we think, we go through a much larger process than we know; just as every time we feel anything we go through a process of which we are quite unconscious. We touch some substance and feel that it is too hot, and snatch our hand away from it instantaneously, as we think. But science teaches us that this process is not instantaneous, and that it is not the hand which feels, but the brain; that the nerves communicate the idea of intense heat to the brain, which at once telegraphs back along the nerve threads the instruction to withdraw the hand; and it is only as a result of all this that the withdrawl takes place, which seems to us to be immediate. The process has a definite duration, which can be measured by sufficiently fine instruments; the rate of its motion is perfectly well-defined and known to physiologists. Just in the same way thought appears to be an instantaneous process; but it is not, for every thought has to go through the stages which I have described. Every impression which we receive in the brain through the senses has to pass up through these various grades of matter before it reaches the real man, the ego, the soul within.

"We have a kind of system of telegraphy between the physical plane and the soul; and it is important to realize that this telegraph line has intermediate stations. It is not only from the physical plane that impressions can be received; the astral matter within a man, for example, is not only capable of receiving impressions from the surrounding matter of its own plane, and transmitting those through the mental body to the real man within. So the man may use his astral body as a means for receiving impressions from and observing the astral world which surrounds him; and in exactly the same way through his mental body he may observe and obtain information from the mental world. But in order to do either of these things, he must first learn how they are done; that is to say, he must learn to focus his consciousness in his astral body or his mental body, just as it is now focused in his physical brain." Leadbeater, *Man Visible and Invisible* (New York: John Lane, The Bodley Head, 1903), 14-16.

[63] Steiner, "The Imaginative, Inspirative, and Intuitive Method of Cognition (1922)," in *Philosophy, Cosmology, and Religion: Ten Lectures Given at the Goetheanum in Dornach, Switzerland, September 6-15, 1922*, trans. Lisa Monges and Doris Bugbey (Spring Valley, NY: Anthroposophic Press, 1984), 49-50.

[64] Steiner, "A Lecture on Eurhythmy (1923)," 67.

[65] Ibid.

[66] Ibid, 64.

[67] Different forms of Theosophy and mysticism, including Anthroposophy, were present at Monte Verità. There was also a major concentration of Steiner adherents in nearby Locarno. Laban occasionally collaborated with different figures from these groups and was both a Freemason and a member of an occult group, the Ordo Templi Orientis, although Steiner was his clearest inspiration for developing his own method of reformist pedagogy. The O.T.O. is best known today as being the proving ground for the notorious occult figure Aleister Crowley, who also had deep connections to other occult groups. For the O.T.O. in particular see Francis King, *Secret Rituals of the O.T.O.* (Samuel Weiser, 1973).

[68] Dalcroze himself had no interest in teaching dancers, but was welcome to discuss and demonstrate his theories to dancers and theorists of stagecraft, and readily encouraged his students to work on the theatrical productions of his friend Adolphe Appia.

[69] Wigman's fame as an independent artist came toward the tail end of the 1910s when she left Laban's circle and began performing on her own.

[70] Dörr, Ibid, 24.

[71] These courses began in 1913 but proceeded in earnest after the beginning of World War I, once likeminded pacifists and radicals flocked to Zürich. An exhibit on Monte Verità that Laban saw in 1912 while he was in Vienna convinced him and Perrotet that they should move to Switzerland.

[72] The essential source for Monté Verità is still Harald Szeemann, *Monté Verità: Berg der Wahrheit*, exh. cat. (Milan: Electra Editrice, 1978); see also Martin Green, *Mountain of Truth; the Counterculture Begins, Ascona 1900-1920*, (Hanover, University Press of New England, 1986).

[73] Hodgson and Preston-Dunlap, op cit, 35. The Laban Center in London is still a very active institution. http://www.laban.org/.

[74] Evelyn Doerr, *Rudolf Laban: The Dancer of the Crystal* (Lanham, Toronto, and Plymouth: Scarecrow Press, 2008), 43. Doerr is currently compiling a collection of Laban's letters. Wundt's notions of mind and body were part of Laban's early studies of anatomy while he lived in Paris and studied art and architecture from 1900-1910. He had also pursued more pathological variants of movement by investigating the relationship between insanity and expressive gesture during frequent visits to an asylum at St. Maurice.

[75] Doerr, in describing Laban's encounter with the VP, has argued that "the choreographer found that his view of the world, in which humans and nature are ruled by fundamental principles and in which human life constitutes part of a cosmic movement of nature and forms a morphologically

organized whole with this universe, was confirmed by all of these scientific discoveries." op cit, 58.

[76] Laban, press release for the Labanschule, 1913, quoted in Dorr, Ibid, 38.

[77] "Wir setzen 'Denken' im Sprachgebrauch mit 'Kopfarbeit' oder 'Gehirntätigkeit' gleich. Ist hier nicht der Ausganspunkt einer Forschungsreihe und einer Folgerungsreihe gegeben, an deren Abschluβ der physiologische Teil des Denkvorgangs als klarumschriebener Bewegungsvorgang im Nervensystem und anderen Organen des Körpers vor uns stehen wird?" Laban, Die Welt des Tanzers (1920), 16.

[78] That alteration came from moving in new ways. As he summarized in his later memoir, *Ein Leben für den Tanz* (1935):

Movement is first and fundamental in what comes forth from a human being as an expression of his intentions and experiences. One must always remember that all sound productions, such as speaking, singing, and shouting, spring from physical actions, or in other words from movements." Laban, *Ein Leben für den Tanz* (1935), trans. Lisa Ullmann as *A Life for Dance* (London: Macdonald and Evans, 1975), 85. Further citations refer to this edition.

[79] Laban, *Ein Leben für den Tanz*, 86. The purpose play was expression with the intent to alter the thought processes of a group through alterations of bodily rhythm that Laban believed were shared in his audience and in his dance troupe; rhythm that his dancers had learned to mould like clay, which they could then convey to the audience as newly learned movement languages. "Seeing" another's gesture also included direct participation and feeling it within oneself, regardless of whether one was on the stage or in the audience. Laban described this belief in a lecture from 1927 by arguing that "communication of dance content is derived from rhythmic-spatial changes in the dancer's movement. The spectators perceive and understand the spiritual and instinctual components of the dance through their own sense of movement." Vera Maletic, paraphrasing a talk given by Laban at the First German Dance Congress in Magdeburg (June 21-24, 1927) titled *Das Tänzerische Kunstwerk*, in Maletic, *Body-Space-Expression: The Development of Rudolf Laban's Movement and Dance Concepts*, (Berlin, New York, Amsterdam: Mouton de Gruyter, 1987), 11. Laban's speech is reprinted in *Die Tat* (November 1927): 588-591.

[80] Wigman, *The Mary Wigman Book*, ed. and trans. Walter Sorell, (Middletown: Wesleyan University Press, 1975), 33-34.

[81] Das wichtigste und bedeutungsvollste Element der Körperbewegung ist zweifellos die Raumrichtung. Formgebende Kraft läβt durch den Raumrichtungswechsel die bewegte Form, den

Körper, einmal gestreckt, erhaben, dann wieder gekrümmt, gedrückt erscheinen. Zahllose Formen sprechen von zahllosen Stufen der Erregung, denen der Körper in seiner Gebärde folgt. Laban, *Die Welt des Tänzers*, 17.

[82] Der menschliche Körper folgt in der Bewegung bestimmten räumlichen Gesetzmäβigkeiten. Jede Bewegung besteht aus mehreren Richtungsspannungen, die sich gegenseitig das Gleichgewicht halten. Die Raumneigungen dieser Richtungen sind, mehr oder weniger ineinander laufend, verwandt. Laban, Ibid, 141.

[83] Vereinfact dargestellt gebiert eine Spannung im Zentralorgane unseres Nervensystems, dem Gehirn oder viel wahrscheinlicher noch im ganzen Körper, den Gedanken. Anatomische, physiologische und pathologische Studien haben Aufklärung darüber gebracht, daβ gewisse Teile des Gehirns bestimmten Sinnesorganen und Gedankenkomplexen entsprechen. Laban, Ibid, 27.

[84] John Hodgson and Valerie Preston-Dunlop, *Rudolf Laban: An Introduction to his Work and Influence*, (Plymouth: Northcote House, 1990), 36.

[85] "Die Schwankungen folgen dem Raumgesetzen der Eurhythmie. Sie schwingen also nicht wahllos von einem beliebigen Umkreispunkt zum anderen, sondern folgen den Gesetzen der Kombination und Folge, die auch die mitverflochtene Gemütsbedeutung des Raumspiels bedingen. Als eines der wesentlichsten Gesetze der Gebärdenkraft erscheint das Bestreben, das Verhaltnis zwischen der Schwerkraft und Leichtkraft durch immer höher gesteigertes Leben eurhythmisch zu regeln." Laban, *Die Welt des Tänzers*, 76.

[86] Dörr, op cit, 36.

[87] "Was ist der Wohlklang? Er entschwebt dem Munde des Sprechenden. Immer wieder bilden Lippen, Zunge und Mundhöhle neue Gebarden, vollführen einen Tanz. Der Atem erzeugt eine Erschütterung der umgebenden Luft, die das Abbild der Bewegungen der Sprechorgane als Wellengebilde in unser Ohr tragen. Ebenso trug vorhin die Lichtwelle das Abbild der Bewegungen des ganzen Körpers unserem Auge zu." Laban, Die Welt, 14.

[88] "Der physiologische Akt des Vor- und Rückwärtsbewegens der Zunge, des Breitziehens und Spitzens der Lippen und alle anderen Formen der klangenbildenden Bewegungen wie die des Brustkastens, der Kehle und der Mundteile sind an sich Gebärden, das heiβt sie sind Zusammenklang einer Muskelbewegung mit einer Gefühlserregung und einer Verstandesleistung." Laban, Ibid, 15.

[89] Laban conceived a threefold approach to language as word, tone, and gesture, which is deeply reminiscent of Wundt's notions of the linguistic component Hodgson and Preston Dunlap, op. cit, 35. This basic formula of language was part of a larger orchestration of all the senses in a trilogy

of "Dance-Sound-Word," that drew emphasis away from a single aspect of the body, or, crucially for Laban, of distinct sense, and instead treated the body as an instrument of polymorphic, intermingled movement patterns or rhythms

[90] Ibid.

[91] Doerr, Ibid.

[92] Ibid.

[93] "Was packt uns in den Formen früherer Handwerkskunst und den Geräten einfach lebender Völker und Rassen? Man sagt, es sei das Primitive. Das stimmt nicht. Es ist das menschliche, das ausdrucksvolle der Geräte. Man sieht: dieser Gegenstand wird in Sinne naturlichen Lebens gebraucht. Wir wollen Rhythmus sehen und empfinden." Laban, Die Welt, 149-150.

[94] Laban, *Ein Leben*, 178.

[95] "Raumgestaltung im Bewegungskunstwerk

Der Gang der Entwicklung ist heute schon klar vorgezeichnet. Es gibt zumindest einzelne Tänze, Szenen, und Anfänge sowohl auf der Bühne wie auch im Lichtbild, die durch ihre Formensprache seelisch ergreifen. Eine bedeutsame Rolle hat dabei der Raumgedanke und damit auch die Raumgestaltung. Je einfacher, klarer, und sinnvoller sie das eigentliche Formenspiel, den Spannungskampf der darstellerischen Bewegungen, umrahmt und unterstützt, desto eindringlicher werden wir von diesem gepackt. Namhafte Künstler machen es sich zur Aufgabe diesen Rahmen formdichterisch zu gestalten." Laban, Ibid, 197.

Chapter Four

The Cabaret as Laboratory: Operating on Gesture in Zürich

"Art needs an operation." – Tristan Tzara[1]

This chapter outlines Zürich Dada artistic practice as varying manifestations of critical address to Wundt's theories of the functional interaction between nerves and thought as it appeared in manifestations of *Lebensreform*. First, I outline Hugo Ball's pre-Dada experiences in Munich, which provided awareness of both the Dalcroze method and more radical uses of it in the German theatre. From this general framing, I consider particular instances of artistic practice in Zürich within three separate categories of performance, art, and language. Based on this initial analysis, I return to the broader practices of chance and spontaneity in the practices of Zürich Dada to the historical context in which these phenomena triggered nervous change. I focus on Ball's performances of sound poems as taking Laban's ideas and practices of the *Freitanz* and carrying these methods to the stage space. In the collaborative art of Sophie Taeuber and Hans Arp, they applied notions of improvised movement from Laban's free dance as the means of artistic creation. The chapter concludes with an extensive examination of the ways in which Tristan Tzara's extensive theories of language drew on and modified Laban's Wundtian theories of language in which the faculty is an articulatory movement.

In order to place a semblance of organization over what is arguably the most disorganized group in the history of art, I have divided forms of expression that Dadaists understood as inseparable. Thus, my ultimate goal is to establish the critical approach to physiological psychology and *Lebensreform* that enabled Zürich Dadaists to approach every kind of art as a movement art (*Bewegungskunst*) or a chance to rearrange space (*Raumgestaltung*) in a polyrhythmic or (more often) arrhythmic fashion.

Ball in Munich

While living in Munich before WWI, Hugo Ball learned about many applications of physiological psychology in culture. He first learned of Wundt's theories during his university study in Munich from 1906-1910, where he attended the lectures of Theodor Lipps, who incorporated the Leipzig psychologist's theories into his lectures on aesthetics to such an extent that for the young Hugo Ball, artistic expression and physiological psychology were facets of a single inquiry.[2] Lipps provided him with the groundwork for encounters with more radical approaches to Wundt's work by artists whom he would soon meet.

Ball's extensive involvement with avant-garde theatre in Munich gave him contact with people who utilized techniques of modifying human neurophysiology as the bases of expressive and social reform. Certain of them had adopted elements of the Dalcroze method into either their tutelage of young actors or their own independent artistic practices. Against the protests of his family, Ball had abandoned his university studies in 1910 and enrolled in courses on acting and stage design at the Deutsches Theatre of Max Reinhardt (1873-1943) from September 1910-May 1911.[3] His time at

Reinhardt's school is cloudy in terms of specifics, but it is extremely likely that it included a study of the Dalcroze method, which was a central element of the director's curriculum.[4]

While in Munich, Ball also encountered the actor Frank Wedekind (1864-1918), who had met Dalcroze during a visit to Hellerau that same year and had incorporated eurhythmic gestures into his stage performances, which caused a great deal of controversy in his audience.[5] That Wedekind was a major inspiration for Ball cannot be doubted. He read portions of the actor's works as part of two literary readings at the Cabaret Voltaire on February 5 and 6, 1916. Wedekind or Reinhardt may also have encouraged Ball's trip to the Dalcroze Institute at Hellerau toward the end of 1913.[6]

At Hellerau, Ball was unimpressed by the polished attempt at synthetic expression in stage productions, but did take to the pedagogical exercises of the *Turnen* as shown to him by Dalcroze's patron Wolf Dohrn. He wrote to his sister that of all the performers he saw during his trip, students of eurhythmics were the most modern.[7] As outlined in the previous chapter, Dalcroze's intentions for culture and expression were rather conservative in comparison to the stridency of the German Expressionist stage. However, his methods of reorienting an individual to culture through neural modification inspired many different applications of Dalcroze's basic theories to divergent ends by figures in German-speaking culture.[8]

Another artist Ball met in Munich was Wassily Kandinsky (1866-1944), whose uncle translated Wundt's *Grundzüge* into Russian in 1912, the same year that the two men became friends. The Russian artist encouraged his embrace of the new philosophy of gesture that expressive dance could bring to the entirety of artmaking.[9] Ball was

extremely disappointed when the outbreak of WWI dashed his hopes for collaborating with Kandinsky on a new form of theatre and an associated publication akin to the *Blaue Reiter Almanach.*[10] Kandinsky's theories offered Ball some of the most profound approaches to physiological psychology as the means to reform expression. For example, Kandinsky's 1911 text *On the Spiritual in Art* outlined the painter's belief that an artist had to approach all forms of artistic expression as different facets of bodily motion that one had to merge in order to achieve more potent expression:

> The achievement of the dance-art of the future will make possible the first ebullition of the art of spiritual harmony—the true stage composition. The composition for the new theatre will consist of these three elements:
>
> (1) Musical movement
>
> (2) Pictorial movement
>
> (3) Physical movement
>
> And these three, properly combined, make up the spiritual movement, which is the working of the inner harmony. They will be interwoven in harmony and discord as are the two chief elements of painting, form and color.[11]

Ball's friendship with Kandinsky allowed him to consider Wundt's ideas in intellectual contexts that fell entirely outside the classroom of Lipps and adoptions of eurhythmics in theatre.[12]

Kandinsky believed that an artist's integration of body, mind, and spirit could engender a new harmony and make art the gateway to higher planes of existence and social harmony. As he wrote in *On the Spiritual in Art*, the artist could shape nervous

vibrations with the formal nature of his or her work in a manner that opened the body's neural paths to the rhythms of the soul:

> It is because of the elementary stage reached by our painting that we are so little able to grasp the inner harmony of true color and form composition. The nerve vibrations are there, certainly, but they get no further than the nerves, because the corresponding vibrations of the spirit which they call forth are too weak. When we remember, however, that spiritual experience is quickening, that positive science, the firmest basis of human thought, is tottering, that dissolution of matter is imminent, we have reason to hope that the hour of pure composition is not far away. [13]

As Steiner, whom Kandinsky cited in this text, had sought to do, the artist believed that new art could draw on Wundt's science of the senses in cultivating neural change as the basis of an evolution toward higher realms of consciousness, thereby achieving a connection between the vibrating nerves of the sensory world and the vibrations of the soul. Art could be the stimulus for neural development that cultivated a person's soul and redeemed the spiritual health of modern society.[14]

Ball's friendship with Kandinsky allowed him to learn of radical new approaches to Wundt's theories that had begun to unfold in the context of the *Blaue Reiter* group. Along with familiarizing Ball with the work of the Russian Futurist poets, who shared Laban's fascination with Wundt's theories of language, Kandinsky introduced Ball to the composer Thomas von Hartmann (1885-1956) before the war, who so impressed Ball that he sought to include an essay by Hartmann in his ill-fated work on the theatre.[15] As a young man seeking ways to revolutionize the mind through the senses in the sphere of

theatre, Ball likely read with great interest Hartmann's notion from his essay "Anarchy in Music" in the *Blaue Reiter* almanac, which argued for social reform that began with the senses. According to Hartmann, "the germ of the ideal future function of hearing is already present in the ears we now have, and the law of an ideal hearing will basically be related to the laws of our present hearing, despite its great distance from our time."[16] In a manner that resembles Kandinsky's goal to use art in processes of mental evolution, Hartmann's essay typifies the manner in which the *Blaue Reiter* approached the senses and neural connections to the brain as raw material that art could restructure in a manner that triggered a physiological evolution in the shared thought patterns of society.

As a musician, Ball surely read another essay in the *Almanach* by Nikolai Kulbin (1868-1917) entitled "Free Music," in which he called for "new dissonances with new resolutions," or the use of new sounds to induce nervous change in the listener.[17] As Charlotte Douglas has shown, Kulbin had studied Wundt's work extensively and introduced or popularized his ideas for Russian artists, and it is likely that Wundt's ideas on noise and dissonance, which Ball likely knew from his study with Lipps, were sources for Kulbin's theories of free music.[18] These diverse and idealist usages of Wundt's psychology differed entirely from the more traditionalist models of Lipps that Ball had encountered at university. As a young man, Ball embraced the *Blaue Reiter*'s different uses of physiological psychology to reform society through culture. These connections indicate that by the time he arrived in Zürich, Ball knew many diverse usages of physiological psychology as the foundation for various programs of artistic and social reform. In general, his friends in Munich believed that valid expression had to alter the neural body of both artist and viewer. Dadaists would embrace this openness to new,

supposedly dissonant experiences, but would question the evolutionary trajectory that Kandinsky plotted as a necessity and subsequently fashion the neural body as an expressive instrument to far more critical and jarring ends.

Dada in the Space of Pedagogy: Connections to Pestalozzi

They would do so in spaces connected to major philosophies of *Lebensreform*. Despite the truisms of Dada's utter radicality and break with traditions of all kinds, it is surprising to encounter the extent of its connections to more conventional reformist movements in Zürich—connections that they used to their advantage as a foil for their more critical endeavors. For example, Hans Coray (1880-1974) was the director of the Pestalozzi school in Zürich and came as close as anyone to being a patron of Zürich Dada.[19] His connections to Dada during the early years of its tenure in Zürich, particularly when Ball was still connected to the group, allows one to comprehend the nature of divergence in Dada's approach to the grounding ideas of physiological psychology and *Lebensreform*. Coray was the owner of the gallery which Ball and Tristan Tzara ran for eleven weeks beginning in March 1917 and eventually renamed the Galerie Dada. This space became the central site of many key Dada events following the abandonment of the Cabaret Voltaire in July 1916. Placing Dada back in comparative proximity with the more idealist outlooks of *Lebensreform* against which the group reacted requires familiarity with Pestalozzi's reformist pedagogy and its reliance on physiological psychology.

Coray's *Pestalozzischule* was named after the early nineteenth-century Swiss education reformer Johann Heinrich Pestalozzi (1746-1827), whose theories had become

extremely popular during the First World War.[20] This seems an odd, even anachronistic connection to consider in the historical context of a radical movement like Dada, but the relationship could not be more prescient with respect to Dada's radical engagement of the neural body as the means to change life and society. Many figures in *Lebensreform* embraced the Pestalozzian notion that education—for them, an evolution in consciousness—had to cultivate a person's latent, inner powers. Coray's affiliation with the *Pestalozzischule* and Dada gains significance upon learning of Pestalozzi's basic concepts of pedagogy, which shed further light on the nature of Dada's tactical approach to discourses of physiological psychology and social reform.

Pestalozzi was inspired by Jean-Jacques Rousseau's *Émile* (1762), his lengthy treatise on the education of young children, and by the French Revolution, which Pestalozzi saw as an event that placed power in the hands of those who were too poor (and thus too poorly educated) to self-govern in a rational manner.[21] Despite the immediate shortcomings of *le peuple*, Pestalozzi believed that the sources of social well-being lay within the individual and needed to be gradually cultivated in the proper manner. Based on this tenet, he developed his overall theoretical system of elementary school, and directed several experimental institutes throughout Switzerland, all of which eventually failed due to his lack of budgetary acumen.[22] Although he was an adherent of Rousseau, Pestalozzi did not share the French writer's knack for delivering well-organized statements on his pedagogical systems. Thus, twentieth-century readers had no *Émile* from the Swiss teacher, but instead drew on the many works of secondary literature devoted to Pestalozzi's method written by his students or new adherents.

In this secondary literature, the theories of Pestalozzi became more strongly connected to physiological psychology than in his original texts. Most studies of Pestalozzi that appeared during the *fin-de-siècle* and early twentieth century played up considerably the connections of his ideas to the dominant field of physiological psychology and often focused on his indebtedness to the early psychologist and philosopher Johann Friedrich Herbart (1776-1841), whose 1824 text *Psychologie als Wissenschaft* informed many of Pestalozzi's pedagogical ideas and had, by the end of the nineteenth-century, acquired status as an early masterwork of psychology.[23] Herbart argued that psychology should rely on observation of direct experience, in which one considered interactions of different mental capacities like representation [*Vorstellung*] and sensation [*Fühlen*], but without resorting to experiment.[24] Herbart did not test phenomena of nervous physiology as Wundt did, but he nonetheless recognized the role physiology played in the formation of intellect and summarized the connections with three basic postulates. First, he argued that bodily conditions can hinder the arousal of an idea. Second, and in contrast to the first point, bodily conditions may facilitate an idea's appearance. Third, Herbart also believed that gesture expressed the relative strength of an idea and instanced cooperation between the soul and the body. These conditions were ultimately metaphysical, because Herbart argued that every idea ultimately contained the determining energy [*Kraft*] of its appearance, rather than the bodily conditions that formed the focus of Wundt's experiments. Herbart argued that the strength of an idea determined its clearness and would decide whether it would surpass a threshold of awareness or limen of consciousness and arise in a person's mind. While Herbart argued that *Kraft* was relative strength of an idea, Wundt, by contrast, brought the notion of inner

strengths into a more modern context of experiment and testing by establishing the dependence of *Kraft* on varying levels of innervation in the conductive structure of the nervous system, which formed in direct relation to experience. In this way, Wundt believed that his method avoided the epistemological pitfalls of using the intellect to consider intellect.

Pestalozzi's popularity in Zürich during the time of Dada was due to the connections his twentieth century readers made between the gestural nature of his learning exercises and the neural bases of *Kraft* that Wundt had established as determining the quality of ideas. Pestalozzi encouraged cultivation of the young child's inner potentialities of head, hand, and heart, which required training the student in forming three different kinds of *Kraft*, or particular energies of creative bodily skill sets: intellectual [*Geisteskraft*], practical [*Kunstkraft*], and moral [*Herzenskraft*].[25] He argued that if the senses were the bases of all experience and intellectual function, then one had to train these senses to clearly distinguish objects as the basis for knowledge training in different fields. [26]

Pestalozzi's methods emphasized a high level of physical interaction in the learning processes, so that as students handled objects and gestured with them, they came to know the interaction of sense data, bodily motion, language, and ideas in a social environment. Lessons that were inherently tactile or based on bodily movement were intended to strengthen the most basic peripheral channels of innervation and cultivated techniques of sensory focus on objects from everyday life. This was *Bildung* of the body—cultivation was a gradually ascending process of complexity. Thus, for rudimentary mathematics exercises, students counted and handled actual objects like

pebbles, sticks, or buttons in a manner that allowed for a progressive understanding of number, size, and name as inextricable elements of a single idea. As a student counted, he or she would count not only numbers but particular objects ("one stone," "one button," etc.) and immediately absorb language as a sensory property in direct relationship to tactile encounters. The group nature of these exercises and the attention given to language (which Pestalozzi, like Wundt, drew from Herder) created a structure that cultivated intellectual development according to the intake of distinct sense data in immediate connection to social values of language and concept.[27] Following the belief among physiological psychologists that touch was the most rudimentary of the senses, Pestalozzi argued that these tactile exercises formed the bases of intuitive sense perceptions or *Anschauungen*, in which sensory and moral qualities appeared as inextricably attached to particular objects in the sensory world. Small children counting buttons seems a far cry from the uproar of Dada, but other methods of Pestalozzi's curriculum illuminate the activist nature of Dada performances that occurred in coordination with exhibitions in spaces owned by a figure whose school included this pedagogy.

Tactility and movement had appeared in the counting exercises, but in the domain of *Kunstkraft*, students undertook different movement exercises that allowed them to give external expression to impulses of the mind in the world of the senses. Pestalozzi argued that drawing and rhythmic group calisthenics best facilitated the development of *Kunstkraft*. By drawing, the young child learned a manner of concrete reaction to direct sense perception that fostered his or her spatial awareness. Drawing was a way in which the head, hand, and heart all interacted with space. The finished work mattered little—the intent of drawing was to exercise and cultivate within the student a more harmonious

relation between his or her mind and surroundings by having him or her move graphically in immediate reaction to sense data.[28] The works instanced sensory structures that were in the process of working toward a more harmonious sense of space and a person's place within it. The child's drawing was a move toward more sanctioned forms of knowledge. In this vein of building *Kraft* out of new gestural interactions with space, rhythmic group movement was a more complex means to foster this harmonious relationship between body, mind, and space. As Pestalozzi wrote in an 1807 essay titled "On the Training of the Body: An Introduction to Elementary Gymnastics," students benefitted exponentially from "a series of exercises for every part of the body arranged in a continuous order and designed to comprise the whole range of articulated movements which the child will eventually have to perform."[29] Pestalozzi reasoned that if elementary bodily movements were the basis of all practical skills, then movement drills allowed for further enrichment of bodily and mental powers. These gymnastic exercises showed students the ways in which properly applied physical strength enabled a more efficient knowledge of both intellectual and moral faculties. Pestalozzi thought that a sound mind was the result of a sound body, which his later interpreters understood as entailing a rhythmically functioning nervous system.

For readers during the time of Dada, Pestalozzi's methods appeared as a pioneering effort of *Lebensreform*. This new context of readers saw his work in a more materialist light, in which the innervation structures of young children underwent a concerted building through sensory and ambulatory exercises. Within this new context, the potentialities of psychophysiological alteration promised by drawing and new rhythmic movement became the means to cultivate the neural bases of the mind.[30] In both

the graphic and gymnastic dimensions of *Kunstkraft*, the goal was to develop by graduated instances of practical skill [*Fertigkeit*] a high degree of what Pestalozzi's early twentieth-century readers called "nerve tact," a decidedly non-scientific term that they defined as improved innervation in motor movements that strengthened the relationship between intellectual and executive actions of the thinking and moving body in space.[31]

Figures in the *Lebensreform* movement were quick to make the connections between Pestalozzi's ideas and their own practices. Dalcroze, for example, in an essay from 1905 titled "Music Teaching in Schools," bemoaned the fact that "The theories of Pestalozzi . . . on the musical training of young children have been adopted only by private schools."[32] In a 1924 lecture on karmic relationships, Steiner reminded his adherents that the supposedly radical ideas Pestalozzi had toward education—particularly the training of the mind through exercises of the body—triggered energies in a student's etheric or astral bodies and indicated why "children received infinite benefit from his educational principles."[33] In the early twentieth-century, these ideas fit neatly into the Swiss *Lebensreform* movement and its approach to shaping the neural body into triggering social reform of artistic, anarchist, or mystical orientations.[34] These recognitions were conceived as reciprocal, as well.

The context of Dada in Zürich included immediate connections between the Pestalozzi school and the eurhythmics of Dalcroze. In 1915, Coray hired Marie Elisabeth Scheiblauer (1891-1968) to teach eurhythmics at the *Pestalozzischule* in Zürich.[35] She had studied with Dalcroze from 1908-1911 and worked for Coray in developing rhythmic group movements under the basic philosophies of both Dalcroze and Pestalozzi, which brought notions of nerve tact up to date with theories Ball had seen in action firsthand.

Correspondence between Scheiblauer and Ball exists and it is likely that she witnessed some of the Dada events in Zürich, given her connections to Coray and her likely familiarity with Perrottet and Wigman, who studied with Dalcroze at the same time she did.[36] Coray also commissioned Hans Arp and Otto van Rees to decorate the walls of his school with murals, which were painted over in 1919, once Dada events in Zürich became more abrasive and made the association to his school appear negative.[37]

Ball understood the ideological dimensions of Germany's connections to Pestalozzi, which makes the association of the movement to the school appear to undercut the hopes for a teleological reformation of the self promoted by supporters of Pestalozzi and the broader optimism of *Lebensreform*. Writing on the expulsion of Fichte from Jena over the philosopher's *Wissenschaftslehre* and the controversy associated to it, which led to the philosopher being accused of atheism and nihilism, Ball wrote that Fichte nonetheless "urged the young people . . . to cleave to the state, and he urged the state to follow Pestalozzi's methods to produce Pestalozzian teachers for the education of these youth. A purely Fichtean formula for freedom, dictated by poor memory and inexhaustible optimism."[38] Ball saw this moment in history as a time in which physical culture was closely tied to state obedience and seems to imply that it can only ever be a tool of authoritarianism, whether of politics or creativity.

It is impossible, I would argue, to understand the appearance of Dada in Zürich without comprehending the extensive readings of physiological psychology in spheres of cultural practice and social reform with which the group had extensive contact. Thus, in its approach to the neural body, Dada did not come out of thin air, nor did it simply pick

up and follow one of these different models. It was, instead, based on a selective consumption informed by more critical underlying motives.

Ball and World War I

When Ball moved to Zürich in May 1915, his approach to these ideas of psychology and expression had undergone an irreversible metamorphosis based on his experience of the war. His weak health kept him out of the military, but it did not dampen his curiosity for seeing the fighting firsthand. After two weeks of seeing row upon row of soldiers' graves and bombed out rubble in Northeastern France, the exasperated young man wrote in his diary: "You know, I would really like to understand, to comprehend. It is the total mass of machinery and the devil himself that has broken loose now."[39] It must have appeared to Ball that the dreams of Kandinsky for an evolution of consciousness gained by a coordination of movement arts—which at its base was a manipulation of collective, neural capacities—was tinged by the militaristic applications of *Körperkultur* in Germany before and during WWI. In his 1920 essay "*En Avant Dada*," for example, Ball's colleague Richard Huelsenbeck was explicit concerning the prominence of rhythmic group movement in the lead up to war: "Germany was seized with the mood that always precedes a so-called idealistic resurrection, an orgy à la *Turnvater*-Jahn, a Schenkendorf period."[40] In his condemnation of the war, Huelsenbeck called attention to the enabling of collective thought in the reformist dimension of group motion in *Lebensreform*, onto which various state figures had grafted a nationalist military spirit. When he arrived in Zürich, Ball was against the notion that a single physiologically constructed modality of ascending complexity in the realm of consciousness could generate a rational form of social harmony.

Considering certain of Ball's diary entries in relationship to one another illuminates his sense of the ways in which one could work with physiological psychology in order to undermine its stated theories, the social reformist models that relied on it, and construct a model of expression that would avoid being co-opted by its developmental assumptions. He expressed his general suspicion of the objectivity within this science a few months before the Cabaret opened, writing that "psychology is only an explanation of intellectual and cultural phenomena by biological hypotheses; it is a destructive trend with which all psychology will cease rather than receive fresh impetus."[41] Ball's suspicion of this psychology motivated his revolutionary use of it in the sphere of radical artistic expression. He soon began describing his goal as cultivating the body's potential energies in order to create new forms of expression and thought: "The question is only if we can break through to this spark without tearing down the walls that confine and stifle it. From a sociological point of view, man is a crust formation. If the crust is destroyed, perhaps the core is too."[42] Ball's suspicion of physiological psychology and Lebensreform was the first step toward his critical refashioning of its basic theories into revolutionary forms of culture.

For Ball, the "spark," or interior energy of potential nervous structures, had to be triggered by abrasive sorts of vibrations in the sphere of culture that would go through the body's periphery or "crust" into the neural tissue, thereby altering it. Ball described this idea in a diary entry, in which he has reworked Hartmann's earlier emphases on inner potentials of the sensory organs as the site of mental change, but has effaced entirely the evolutionist aims of the composer to reform the life of culture by cultivating pre-existent bodily capacities: "The levers to pry this stale world of ours off its hinges are in man

himself."[43] Ball's experience of the war and the general ill view of society brought on by exile and poverty fueled his suspicion of Expressionism, but he retained an interest in altering the nervous bases of consciousness by introducing new forms of bodily movement in a manner that used the discourse of *Lebensreform* against itself.[44]

Like Wundt's physiological psychology, the discourses of *Lebensreform* that used these theories in the search to alter the collective mind through the bodies of its subjects were themselves open for uses that deviated from the redemptive ambitions of the movement. Ball's diary clearly shows his awareness of the need to take the means of these different reformist methods and divert the formative trajectories toward more intense and heterogeneous experiences and expression. These lines from his diary are the clearest statement on this overall critical project:

> People will not see that a revolution cannot be "made" except by an accelerated relearning. The reversal in Germany will presumably come from the disorder and defenselessness. That cannot be made; it makes itself. One can try to do justice to the facts and to the intrinsic style of the times. If things rumble, let them rumble. A new basis will emerge.[45]

Ball's hopes for an accelerated relearning came from a cultivating of discordant gestures within this context of reformist groups that pursued various connections between the neurophysiological body and reformed social harmony. But they did not reject the notion of community outright.

Staging Chance

Comprehending the ways in which Zürich Dada used the neural body and its place as the basis of group expression lies in the different usages by its proponents of chance, improvisation, and spontaneity in the sense these terms had in the context as key means to alter neurophysiologial phenomena. These concepts were mainstays in Dada. For example, as the artist Marcel Janco acknowledged, "All our sketches were of an improvised nature, full of fantasy, freshness, and the unexpected. There were few costumes, little direction, and few sets."[46] Even in scripted works, chance occurrence was always welcome. In a lecture on Dada from 1922, Tzara declared, "What we want now is spontaneity. Not because it is better or more beautiful than anything else. But because everything that issues freely from ourselves without the intervention of speculative ideas, represents us."[47] Chance was a mainstay in Dada artmaking, but the notion generally appears in literature on the movement as undefined, save for its hermeneutic consequences—namely, deskilling, criticism of the creative individual, or the generation of a more process-based creative orientation, all of which are ahistorical notions that one can apply to any use of the technique in the twentieth-century.[48] Chance has certain meanings in particular contexts and the bodily, neural consequences of chance in the historical context of Zürich Dada illuminate the reasons for its use.

Laban's *Freitanz* exercises most likely inspired the Dadaist interest in spontaneity and chance as experiences that changed the nerves in unexpected ways. Numerous collaborations of Laban's students with the Dadaists make any separation of their artistic activities a false division.[49] Scholars have acknowledged the importance of the relationships between Dadaists in Zürich and students of Laban's school, but it has been difficult to establish deeper reasons for these relationships and collaborations. Both

groups drew equally from physiological psychology and its outline of nervous and mental change, as did other groups in Switzerland.[50] Laban's notion that chance was a means of nervous change and his use of Wundt's theory that language was a form of gesture became major intellectual sources for Dada, which the group used in new ways.

Dada artists offered various praises of Laban, his school, and his students.[51] Hans Richter reminisced that, "If the *Café Odéon* was our terrestrial base, our celestial headquarters was Laban's ballet school."[52] Ball's fascination with these exercises is apparent in a short essay on Laban that appeared in the November 15, 1917 issue of the *Berner Intelligenzblatt*. Laban, Ball argued, had taken pedagogy beyond a mere development of abilities and had created a way to educate artists:

> Since Herr von Laban moved his dance school from Munich to Zürich in 1913, that Institute has grown in its self consciousness and the scope of its curriculum. Today, the Laban school has, in the necessary evolution of its basic concept, far outgrown what a dance school of traditional type can offer its students. It has developed into an institute that allows not only for the development of abilities, but also the education of an artist. As education of the whole person, it spans the entire breadth of eurhythmy. It is a matter not only of technique; it is especially an art pedagogy, of which dance, tone, and word are only the practical domains of the culture of expression. Aside from the nurturing of his spiritual and physical talents, the student shall also have the opportunity to learn/grasp how his art relates to the rhythmic and cultural whole. [53]

For Ball, Laban took full advantage of the potential breadth of eurhythmics and expanded upon the scope of modifying the neural bases of thought in a manner that greatly

increased the *Kraft* of expression in the group. Previously distinct categories of expression like speech and gesture became dimensions of neural energy and the means to cultivate within the body a new expressive form.

A student in Laban's school who received an education in dance, sound, and word was able to cultivate mental and physical talents, in order to connect his/her particular techniques of expression to a collective awareness of rhythmic, cultural wholeness.[54] Dadaists also became attached to Laban's dancers. In addition to Arp and Tzara becoming romantically involved with, respectively, Sophie Taeuber and Maya Chrusecz, many Dada publications contain laudatory reactions to dance and performance. For example, a poem by Tzara called "*Carnage Abracadabraut*" published in the last Dada journal from Zürich called *Der Zeltweg* (November 1919), appeared below a photograph of Laban's colleague Mary Wigman:

> *l'antenne tremble sous l'abat-jour, cuisine de sabbats meteorologiques, baggage, soupe / stellaire dans l'ouragan lueur solonnelle / strident éclairage DO majeur projections d'hélices et poudre blanche dans la bouteille clé / de 1er ordre garantie pour toutes les malles / je m'amuse dans le triangle de fer*.[55]

The title of Tzara's poem captured not only the power of Wigman's art, but it also lionized the corporeal mutation triggered in the body by new movements, which is the basic concept that informed the overlap between the *Labanschule* and the Dada circle. Tzara's lines on Wigman may have been inspired by participating in and witnessing a notorious soiree in May 1919 that involved what is perhaps the most coordinated intermingling of Dada artists and Laban students. This evening featured Sophie Taeuber's best-known Dada performance "*Noir Cacadou*," which included her and four

other Laban students wearing masks and costumes designed by Marcel Janco and dancing before a large painted screen designed by Richter and Arp. According to Tzara's "Chronique Zürichois," Arp also helped design the costumes. Laban's students also performed dances that Ball and Tzara had separately choreographed. Another key performance was Tzara's simultaneous poem for seven voices, *Sous les ponts de Paris*, so-called for the intermittent invasion of the popular tune over the voices of his seven performers, all of whom were Laban's students.

Their radical use of chance as a technique of neurophysiological change informed their reframing of cultural expression as producing discordant, base vibrations and currents that altered the mind. This practice had two consequences. First, it diverted techniques of Wundtian inquiry away from taxonomy toward uncharted territories of elemental group experience and expressive ways of knowing. In probing this consequence, Dada was no different than the *Labanschule*, but on this point, the similarities end. Second, in their use of chance, improvisation, and spontaneity in the spaces of performance, Dadaists approached performance, poetry, and plastic art as a site in which elemental nervous impulses could continually change in a manner that created an inherently fugitive and elemental sense of selfhood and community.

Chance was a mode of laboratory practice, but in that scientific context it sprang from a pre-established structure. Upon establishing a mean threshold of intensity, psychologists would then arbitrarily modify the nature or intensity of the stimulus (generally an electric current or vibration) as a way to test the subject's experience thresholds. Laban's familiarity with Wundt's work allowed him to adopt the bodily consequences of arbitrary modification for his *Freitanz*, in which chance became the

initial means to wear down the body's previously constituted practices and habits—the very structures Wundt and his students were trying to study and map. Laban gave a considerable dimension of neural consequence to any spontaneous form of movement, whether of the limbs or the organs of articulation in improvised vocalization—in short, anything that would increase a person's sensations of new spatial rhythm. In Laban's courses, this initial modification of the body's ambulatory systems of expression provided the basis for an ascendant construction of rhythmic expressive movements that would eventually communicate ideas of higher reality through non-verbal means in his purpose plays. In this context, then, chance was the most elemental trigger of neurophysiological alteration.

Dadaists avoided the graduated buildup of wholeness in Laban's courses, but embraced the dynamism and unpredictability of spontaneity and chance that were features of the *Freitanz*. For example, before a performance by some of Laban's students at the Cabaret on May 30, 1916, Ball and his friends had gathered to prepare the space for the event. Marcel Janco had constructed some masks for the dancers to wear (fig. 14). When he arrived, the Dadaists participated in a collective and improvisational exercise that followed very closely the general characteristics of Laban's *Freitanz*. As Ball recounted in his diary:

> We were all there when Janco arrived with his masks, and everyone immediately put one on. Then something strange happened. Not only did the mask immediately call for a costume; it also demanded a quite definite, passionate gesture, bordering on madness. Although we could not have imagined it five minutes earlier, we were walking around with the most bizarre movements,

> festooned and draped with impossible objects, each one of us trying to outdo the other in inventiveness.[56]

These lines suggest the ways in which the artists investigated the unpredictability of the *Freitanz* and its consequences of spontaneous nervous mutation. Janco's masks created a new sensation of spatial rhythm that encouraged an improvisational exploration of chance compositions in space consisting of movement, voice, objects, costumes, and music, which Ball improvised on the piano. The decidedly chaotic nature of these actions had an underlying philosophy of expressive movement that the Dadaists had gleaned from Laban.

In his diary, Ball described the event exactly like a *Freitanz*: one sensation of spatial rhythm gave rise to other spontaneous forms of motion, vocalization, and expression. Considered as a *Freitanz*, these investigations of spontaneous expression were significant in the sense that each mode of expression contributed new forms of felt vibrations in the bodies of the performers, who reacted accordingly with spontaneous motion, each encouraging the others to invent more extreme gestures. Consequent neural change that arose from spontaneous action had a value in itself, one that Dadaists pursued far more extensively than Laban. Ball was careful to indicate that the actions taken could not have been imagined prior to their undertaking, which emphasized their improvised, spontaneous nature. A few weeks later, he took the crucial step of bringing this scenario of spontaneous gesture onto the stage.

Witnessing dances by Laban students at the Cabaret partially inspired his now legendary sound poems or *Lautgedichten*. These works included *Gadji beri bimba, Labadas Gesang an die Wolken,* named in honor of Laban, and *Elefantenkarawane* (also

known as *Karawane*), which were first performed at the Cabaret Voltaire on June 23, 1916 to an audience that included Laban and Mary Wigman, along with the expected retinue of Dadaists.[57] The next day, when Ball recounted his performance, he focused on the radical new phenomena of interaction that occurred between his bodily movements and semi-improvisational recitation of poetic script. If Ball had a plan for this performance before it began, then he did not follow it.

The famous photograph of Ball in his painted cardboard costume does little to suggest the artist's spontaneous filling of space with new nervous energies of motion (fig. 15). He recalled that his friends had to carry him onto the stage, because he could not walk in his elaborate costume.[58] Restricting prior capacities of the body created new sensations of spatial rhythm and gave way to improvised gestures and vocal intonations. Before the audience, he moved back and forth between three easels that surrounded him on the stage, "flapping my wings energetically."[59] At a certain point in the proceedings, Ball realized that "if I wanted to remain serious (and I wanted to at all costs), my method of expression would not be equal to the pomp of my staging."[60] Intonation had to change immediately. His vocalizations became less like language and more like musical tones, and in true improvisational spirit, he acknowledged, "I do not know what gave me the idea of this music."[61] The extended intonations of his script did not have a defined meter or tempo, which guaranteed that any performance would be unique.

Ball's subsequent performances of his sound poems indicate his attempt to make each recitation differ from previous instances. One way Ball achieved this quality for his work relied on ideas of the *Freitanz* in his pursuit of chance as a collective experience. Out of the many soirees in Zürich, one in particular on March 29, 1917 featured an

improvisational dance routine by the artist and dancer Sophie Taeuber, which she performed in coordination with Ball's recitation of his *Lautgedichten* (fig. 16).[62] Ball's diary entry that recounts the evening extolled the neurophysiological alteration that an improvisational combination of movement could create within an artist as he or she experienced new sensations of spatial rhythm. His language is indebted almost entirely to the basic tropes of physiological psychology. In this case, it did not progress past base intensities and those intensities always changed:

> Abstract dances: a gong beat is enough to stimulate the dancer's body to make the most fantastic movements. The dance has become an end in itself. The nervous system exhausts all the vibrations of the sound, and perhaps all the hidden emotion of the gong beater too, and turns them into an image. Here, in this special case, a poetic sequence of sounds was enough to make each of the individual word particles produce the strangest visible effect on the hundred-jointed body of the dancer . . . a dance full of flashes and edges, full of dazzling light and penetrating intensity.[63]

The improvised and experimental coordination of these different expressive types of movement art—consisting of articulatory movements and more palpable bodily gestures—marked a carryover of Laban's *Freitanz* into the spaces of performance. Ball has outlined how the vibrations of utterance and gong beats were chance stimuli that triggered Taeuber's improvised dance and initiated neurophysiological alteration, thus making her dance valid as "an end in itself," because any experimental treatment of movement was an exercise in nervous alteration. His description of the "hundred-jointed" dancer's body moving in spontaneous reactions to the poet's articulatory movements of

speech clarify the need among Dadaists to increase feelings of "penetrating intensity," or new phenomena of neural change that physically alter consciousness. Reacting to sudden modifications of sensory and spatial conditions became an essential aspect of experiencing culture for both artists and audience. It was not just a new form of aesthetics.

Based on these characteristics of his work, one may surmise that when Ball stripped tonalities of utterance from cultural convention as new forms of sound gestures [*Lautgebärden*], one of his possible ambitions was to fashion the voice into an instrument that sent new vibrations of utterance into the tissues of himself and his audience. His experimental poetry contained a dimension of spontaneous embodiment, in which new forms of vibratory speech altered the neural body and its overall connection to space.[64] He returned the voice to a more elementary level of a moving organ. Examining later performances of his sound poems enables a reading of Ball's poetry as a pursuit of continual nervous change at base levels of vibrating tissues.

In contrast to Laban's uses of improvisation as preparatory means, Ball improvised on the stage space itself. His work was a newly forged coordination of gestures and words that one may consider as a *corporeal* collage—that is, a spontaneous heterogeneity of bodily movements involving myriad nervous reactions to chance occurrences *as* the work of art. Ball's work revealed the artist as one who underwent neural changes on stage, rather than a figure who projected ideas as an individual creative personality with an entirely pre-established intellect. In this reading of Ball's intellectual and artistic endeavors, the historian confronts a shifting persona, in which the neural bases of intellect shifted before the audience.

Artistic production has become an elemental, neural dynamism. The poet himself was decidedly graphic in declaring that this experimental approach to culture involved a forced and improvisational shaping of one's own tissues: "The desperado as the experimental type. He has nothing to make allowances for, nothing to risk. He has his whole person at his disposal. He can be his own guinea pig and must submit to his own vivisection. Nobody can prevent him. What strange things one encounters here!"[65] These explosive lines and other writing on the group by its artists that appear below strongly suggest that seemingly nonsensical or pathological activities in Zürich Dada were neurophysiological activations of unconventional and elemental neural intensities that sprang from spontaneous bodily reactions. In their hands, culture became deliberately experimental alterations of the nervous system.

Ball described the spontaneity in Dada gesture as a form of social criticism. Becoming one's own vivisectionist had an immediate political subtext:

> Our cabaret is a gesture [*Gebärde*]. Every word that is spoken and sung here says at least this one thing: that this humiliating age has not succeeded in winning our respect. What could be respectable and impressive about it? Its cannons? Our big drum drowns them. Its idealism? That has long been a laughingstock, in its popular and its academic edition. The grandiose slaughters and cannibalistic exploits? Our spontaneous foolishness and our enthusiasm for illusion will destroy them.[66]

Gestures of spontaneous foolishness were, in fact, deadly serious, in that the performance of improvisational works of dance, poetry, and song were like the drum that often accompanied the events.

Every impulsive or unplanned action set forth elemental forms of nervous vibration that ate away at the conventional neural structures of higher thought. Continually refreshing these forms of disruption by repeatedly using chance exploded the teleology of body and mind in the materialist psychology that they used so strongly against itself. Reading the Dada use of chance as drawing on Laban's critical use of physiological psychology in his *Freitanz* suggests two particular consequences for the nature of Dada art in relationship to what it built in place of this mechanized butchery described by Ball.

First, the bodily dimension of chance gave their work a certain psychological quality that relied heavily on a particularly raw level of neural *elementalism*, or the basest conductive means that occurred in motion far below levels of volition or conscious thought. The continuous use of chance—that which dissolves habit—as a form of practice, or repeatedly employed creative technique—generated a potent and constructive contradiction in artistic method that turned artmaking into a continuously reactivated scenario of elemental neurophysiology. Dadaists wholeheartedly embraced the notion that chance could reactivate the basest neural impulses within the creation of their art. The gradual buildup of shared practices, habits, and thought patterns within the conventional social structures of *Lebensreform* never appeared. Ball described the social consequences of this focus on neural elementalism:

> One can almost say that when a belief in an object or a cause comes to an end, this object or cause returns to chaos and becomes common property. But perhaps it is necessary to have resolutely, forcibly produced chaos and thus a complete

withdrawl of faith before an entirely new edifice can be built up on a changed basis of belief.[67]

Dada actions withheld the immediate summation of mental building through bodily motion that appeared in other contexts of embodied expression during this moment. Continual pursuit of this level short-circuited the physiological processes required for the gradual building of higher collective thought in and through the sphere of culture, as it appeared in any number of programs dedicated to *Lebensreform*. But Dadaists in Zürich did not reject the notion of community outright.

Second, and in response to these graduated, collective bodily processes of social reform that appeared in places like Hellerau or the *Labanschule*, a notion of community based on shared experiences of comparatively elemental and inherently mutable nervous energies rose out of their collaborative works. Theirs was a community of base neural currents, rather than a superstructural variant of an entirely reformed society. In repeatedly undertaking impulsive and spontaneous artistic practices, Dada artists retained the usage of base neurophysiological stimuli that triggered the initial changes within revisionist modalities of *Lebensreform*, but they avoided the teleological nature of social rejuvenation that lay at the heart of these ostensibly forward-thinking pedagogical models. The most potent way to achieve this experience was to use the science on which these ideals were based.

Basing community on shared experiences of elemental intensities of nervous change was a stark departure from the overall context of progressivist models of *Lebensreform*.[68] For example, Tzara's brief "Note 18 on Art," which appeared in the first issue of *Dada* (May 1917), expressed a need for a new subcollective community knit

together with the same rudimentary neural structure that arose from coordinating movement arts:

> We want to make men better, make them understand that the only brotherhood lies in a moment of intensity in which the beautiful is life concentrated on the tip of a wire rising up to the bursting point, a blue trembling bound to the earth by our loving gaze which covers the peak with snow. A miracle.[69]

Improvement was a shared experience of elemental neural intensities, which shifted creative focus to using the body as a system of movement energies that altered the neural foundations of thought. As Tzara stated in his subsequent "Chronique Zürichois" (1920) about the collective reaction to the ninth Dada soiree, "nerves liquefy muscles jump."[70] The intensity of spontaneity was this and nothing more, but building this elemental community had a redemptive dimension for the group. For example, the day after the "hundred-jointed" Sophie Taeuber danced to recitations of Ball's *Lautgedichten*, he wrote in his diary that the new art, whatever its medium, needed to be "sympathetic because in an age of total disruption it has conserved the will-to-the-image; because it is inclined to force the image, even though the means and parts be antagonistic . . . It drives toward the in-dwelling, all-connecting life nerve; it is indifferent to external resistance."[71] Ball and Tzara were unequivocal in their declarations that creating a collective based on shared experiences of elemental nervous discord—competing vibrations, currents, rhythms, noise, gestures, or expressive movements that filled the performance spaces of their public demonstrations—relied on tactical modifications and critical redeployments of both physiological psychology and the idealist usages of it within reformist movements of wartime Zürich.

Body Languages

Tzara's closeness to Ball allowed him to absorb the rich ideas Ball had encountered in Munich before the war. His writings on Dada language and the visual arts contain the most extensive and diverse critical modifications of physiological psychology and *Lebensreform* of any Dadaist in Zürich. As he sarcastically wrote in his "Note on Poetry" that appeared in *Dada* no. 4-5 in May 1919, "The poet can go in for Swedish gymnastics. But for abundance and explosion he knows how to kindle hope TODAY."[72] The gymnastics to which Tzara referred could be any one of the models previously discussed, but his suspicion of all these different systems of gradual development and improvement could not be clearer. He followed this statement in this text by declaring that "the poet's desire is for enthusiasm, that fecund form of intensity."[73] Tzara's broad swipe at "Swedish gymnastics" testified to his belief in the impossibility of a developmental modality of communal experience. But the brilliance of his interventions came from working with the very discourses of this body theory that informed different dimensions of social reform in order to undercut its developmental ambitions. Like Ball, Tzara recognized that the best way to destroy the *Lebensreform* that pervaded their daily life was to beat its masters at their own game. That meant using physiological psychology in a manner that preserved a highly intense level of unpredictable and spontaneous experience in the sphere of culture, thus collapsing the teleological models of neural *Bildung* that had arisen in contexts of collective movement. In his writing, Tzara focused on creating these new intensities or qualities of experience that arose from a continual change in the basest levels of the neurophysiological mind.

Tzara's contact with dance inspired him to develop multiple modes of poetic expression that stand as attempts to shape the physiological bases and embodied or gestural dimensions of language into more elemental and vibratory emanations that flooded the nerves of the listener or reader. In the first issue of Dada (July 1917), he described Laban's school and performances by Wigman, Taeuber, and other students, indicating the potency of the expressive movement he learned from the dancers:

> *L'école de danse Laban: montra dernièrement son activité multiple et équilibrée. Mary Wiegmann* [sic]*: finesse grandléger créatrice d'abstraites notions d'expression sans musique – pures. Vase pour les vibrations du silence. Mme. S. Perrottet fait chanter les pauses d'une infinie et sage sensibilité. Calme fiévrieux du blanc le plus intérieur. K. Wulff, H. Langwara montrent de l'entendement pour la ligne large puissante. Mlle. S. Taeuber: bizarrerie délirante dans l'araigné de la main vibre rythme rapidement ascendant vers le paroxysme d'une démence goguenarde capriceuse belle. Costume de H. Arp. Dans un autre genre – enfantin aigu et trop harmonieux, giratoire – et avec plus de liberté gracieuse la première – se releverent Mlles C. Walther et Macciachini. Les costumes que Mlle. Chrusecz fait pour l'école: forme et coleur dans la pureté du rythme: sévère nécessité ligne droite clarté chaude simple.*[74]

Tzara's clear fascination with Laban's students encouraged his interest in exploring how expression could enact psychological change by means of different rhythmic vibrations. He applied the bodily production of culture to language and described utterance as different frequencies of nervous movement arising from the same centers of action that generate the movements of dance.[75]

As Ball did in his written considerations of expression, Tzara used key terms and concepts from physiological psychology in a social-critical manner. For example, the notion of intensity, which appears frequently in Tzara's writings, is the categorical term of strength that physiological psychologists applied to the level of irritation [*Erregung*] in nerve charges.[76] In short, the word was akin to terms like velocity for other moving objects. Wundt used the term *Intensität* to refer to both the strengths of sensations and correlative neural charges and generally used the term *Geschwindigkeit* [velocity] to refer to speeds of both innervations and thought, as in tests on reaction time or experience thresholds.[77] Tzara was entirely aware of this terminology. A simultaneous poem called *Cacadoufarbige* performed by Arp, Serner, and Tzara at one of their soirees, which was subsequently published in *Dada* 4-5, directly addressed these notions of bodily and mental energy:

> Toréadore de la verte cravatte sous les gâteaux empaillés au bout des fils névralgiques pette pette dit le poete la tribune de coeur et de Genève par excellance pâques. Es ist nicht leicht, Geschwindigkeiten ein gutes Gewissen zu besorgen.[78]

In this short piece, the three artists plotted an ironic trajectory leading from the initial stages of constructing a social collective on neural bases, the *fils névralgiques*, to the termination point, which is a socially sanctioned mode of morality or conscience. The artists' stated difficulty in finding a conscience was their reaction to the aftermath of nationalist fervor that had left millions dead.

These concepts of nervous energy and psychophysical alteration strengthened the motifs of inquiry in Tzara's well-known "Dada Manifesto" of 1918, which he first read at

the Salle Meise on July 23, 1918 and subsequently published in *Dada* no. 3 (December 1918).[79] His metaphors are couched in the discourse of physiological psychology—specifically, of how the brain forms itself out of repeated, raw sensation: "Logic is always false. It draws the superficial fibers [*fils*] of concepts and words towards illusory conclusions and centers."[80] Tzara's critical view of the mind frames a conventional structure of conductive fibers leading to organic centers in the cortex. Logic was merely a hollow projection of an eternally mutable mass of intertwined tissues. Its authority was a physiological coincidence.

In order to work outside this false projection, modes of linguistic expression with conspicuous proximity to their bodily, neural origins would need to be created. One of Tzara's best known declarations called attention to the particularly linguistic dimension of these theories. In his "Dada Manifesto on Feeble Love and Bitter Love," he declared, "Thought is made in the mouth."[81] The preceding lines of the manifesto posit the source of language in the articulatory movements of the vocal organs—organs that, he believed, were untapped resources of new and more intense artistic expression: "Must we no longer believe in words? Since when do they express the contrary of what the organ that utters them thinks and wants?"[82] The failure to change language was not a question of language itself, but that language's point of origin. As an intellectual mode of expression, language came from the cortex, what Tzara had described as "illusory conclusions and centers," because these structures were conditioned in their formation by a certain space of experience. Placing thought in the mouth returned linguistic expression to its point of origin in neural energies of the articulatory organs. Adding spontaneity to that situation

would consequently reshape the vocal instrument into means of creating more intense vibratory emanations of utterance.

In his diary, Ball expressed similar ideas when he considered his *Lautgedichten*, writing:

> The "simultaneous poem" has to do with the value of the voice. The human organ represents the soul, the individuality in its wanderings with its demonic companions. The noises represent the background—the inarticulate, the disastrous, the decisive. The poem tries to elucidate the fact that man is swallowed up in the mechanistic process. In a typically compressed way it shows the conflict of the vox humana with a world that threatens, ensnares, and destroys it, a world whose rhythm and noise are ineluctable.[83]

Ball's thoughts suggest that the work was a realization of the subject's immersion in the chaos of newly perceived space in a manner that compiled spontaneous reactions to elemental rhythms and forces and presented the artist as a continuously mutable element among others, rather than remaining above the fray with an independent creative will. The "wandering" organ was Ball's way of describing spontaneous speech that occurred outside structures of rational language and thought.

In a similar manner as Ball's *Lautgedichten*, a great deal of Tzara's performed poetry was heavily improvisational and involved what he referred to in his "Unpretentious Proclamation" (1919) as "spontaneous acrobatics," in which one affirmed "the vitality of every instant."[84] Affirming each instant with spontaneous movement withholds the formation of individual style. In the light of collective vocal recitation, these ideas instance Tzara's interest in utilizing the neural mutation that improvised

speech can bring to an experience of culture as a way to create a new form of group thought that was dynamic and non-developmental. In his famous statement that thought was made in the mouth, he unequivocally invoked the bodily process of inventing new words that took place in the *Freitanz* of Laban and his speech exercises that were constructed to alter the organs of articulation. Tzara's attack on language as a false form of expression and social control thus has an unacknowledged dimension in his focus on the organs of speech, and in this focus his goals overlap with the psychophysiological interests of Laban and the other Dadaists who worked with him in Zürich. But unlike Laban and like Ball, Tzara brought these improvisational acrobatics of organic alteration to the stage space.

Tzara himself addressed these issues long before he penned his lengthy praise of the *Labanschule* quoted earlier. For example, at the first Dada soiree on July 14, 1916, he presented a new form of simultaneist poetry that he called *poèsie mouvementiste*, for which recitation of a text included improvisational movements of the body. Although Tzara surely knew of earlier endeavors by French poets or the Italian Futurists, in focusing on gesture, he drew most heavily on Laban's experimental exercises of coordinating body and voice movements from the *Freitanz*.[85] As an unpublished manuscript indicates, Tzara had an entire program planned for the performance, in which he began by describing in humorous fashion the simplistic, habitual conveyance of poetic expression, in which "one recited poems by raising the voice and the arms."[86] In contrast to the more habitual gestures of expression that occurred during such readings, he declared that "the poems that we write now are no longer adapted to this conventional manner of recitation. The actor should join primitive movements and noise to the voice

as types of exterior expression, adapted in a sense from poetry."[87] New or deliberately improvised coordination of bodily movement, he believed, would "accentuate and place in evidence the sense of words by primitive movements."[88] In other words, Tzara's poetic form contained the same ambition as Ball's *Lautgedichten*: use of elemental and/or improvised gestures of limbs in combination with sound gestures to create an immediate space of reactive stimuli that fell outside prior experiences of poetry for both the poet and his or her audience.

Tzara outlined reference points in his envisioning of this elemental mode of related movements that his performance would enact:

> We want to represent intensity. It is why we return toward the primary elements. Children recite verse in chants and to each sound corresponds a special and defined movement of direction and sonority. The most primitive movement is the gymnastics which corresponds to the monotony and idea of rhythm.[89]

If intensity is the relative property of any nervous irritation, then how does an artist represent such a thing? Intensity is a new experience for the neural body prior to thought and one therefore must convey it with new forms of motion. Tzara believed that these new intensities of nervous irritation arose from modes of coordination between movements of vocal articulation and gestures of limbs, or sound gestures of voice and forms of non-verbal communication—i.e., what Wundt had defined as gesture language [*Gebärdesprache*]. In his later *Chronique Zürichois* (1920), Tzara went so far as to call his new poetic form a *poème gymnastique*, which further attests to his interest in exploring the relationships between voice and other forms of bodily motion.[90] Intriguingly, Tzara's mention in his manuscript of "masks by Janco" suggests that

performers, possibly students of Laban, performed improvisational movement routines to these works as he recited, in a manner that was akin to Taeuber's improvised performance in combination with Ball's *Lautgedichten*. It is unclear exactly who did what on the stage that night, but Tzara undoubtedly saw movementist poetry as a way for artists to probe new energies of relationships between the movements of limbs and those of the articulatory organs.

These neural energies had an elemental level that Tzara and other Dadaists associated to the physiological nature of primitive societies in addition to the affectivist outlooks these groups possessed, for in this context, physiology was the zone in which change could most readily occur. The Dadaist use of culture to shape mental experience through the nerves took full advantage of the congruent mechanics of disruption that existed between combining the discordant vibrations of noise or inhabitual movements and the abrupt, unexpected currents of stimuli applied to tissues in the lab. On the stage, these different *Raumgestaltungen* of tones and noise were all forms of arbitrary modification that flooded the manifold tissues of the cortex. Potent realizations of these two modes of modification erupted throughout activities in Zürich, as in, for example, the recitation of Ball's *Lautgedichte* combined with gong blasts and Taeuber's reactive movements. This motive had also appeared in Laban's improvisational *Turnen* sessions, in which the body was a multimedia instrument of dance, tone, and word. Tzara's work exemplifies how, once again, Dada brought the corporeal mutations of the *Turnen* to the stage space and raised the stakes of how culture could change minds through bodily absorption of new vibrations. Intensities of inhabitual vibrations created higher level irritations in the tissues.

Repeated stimuli of this kind would shift nerve paths through pathbreaking or transference in a fashion that altered the psyche in unpredictable ways during the unfolding of the recital. As a model of community, this mode of artmaking suggests that artists in Zürich sought to reform a group through non-ascendant means by connecting its members through new, felt vibrations of elemental rhythm and shared experiences of continual reformation. Its absorptive mechanics were indescribable, below the projective capacities of conventional selfhood, and continually altering in the nature of its intensities. Dada was a separatism based on a shared and continual dynamism of bodies knit together with base vibrations of elemental action patterns. When culture was a *Freitanz*, it never became a social fact.

Sharing in an intensity of new movement languages through improvised performance encouraged similar metaphors from artists in Zürich concerning how groupthink grew from communal mutation of the psyche's nervous substrate. Forcing these discordant sensations into consciousness presents the mental image as an explosive diversity of chaotic, reactive energies that prevents any mode of habitual focusing or reaction. Also, sympathy is not empathy; flooding did not allow for a projection of selfhood and ego, but instead sent new vibrations through everyone's tissues and shifted structures into new basic formats. Doing so as part of a group allows for a shared experience of new rhythm that knits the group to a base constellation of movement languages that can then shift with new patterns of action and shared creation.

Refashioning language in a cosmic manner sprung from this intent to alter the subject's physiological roots, which prevents the formation of any representational logic of primitivist appropriation, because it involved the sculpting of a neurophysiological

platform that was elemental like primitive subjectivity, but was not African. As Laban expressed in his memoir, drum language was an essential inspiration for these exercises; particularly its use by a person in a culture "to communicate with another over unbelievable distances, in a so-to-speak telegraphic manner." [91] These more remedial forms of gesture in the Dada context connect to the value of more rudimentary forms of gesture language in establishing new forms of collective experience based in bodies rather than concepts.

Framing the arts as improvisational movement arts collapsed the habitual orientations required for schemes of visual representation that are generally associated to the appropriationist procedures of the primitivist moment and promised new conceptual platforms of the relationships between gesture and consciousness. No one was copying, but this factor is rather confusing, given the continual referrals to "*poèmes et danses negres*," "Negro" rhythms, occasional transcriptions of actual African poetry in Dada periodicals, or well-known referrals to supposedly "primitivist" artistic practice, as in this oft-quoted passage from Ball's diary: "Huelsenbeck has arrived. He pleads for stronger rhythm (Negro rhythm). He would prefer to drum literature into the ground."[92] Drumming literature into the ground required a refashioning of language into more elemental, pulsing rhythm that sent new vibrations into the body. The seeming formalism of this focus was a direct assault on conventional materialism of the corpus. A small group with newly oriented bases of physiology may act primitive, but would not be African. The only thing this group would share with the Other was a perceived similarity of neurophysiological level of impulse.

The primitivism of Zürich Dada was not an escapist return to nature, but a cultivation of urbanist and elementalist space patterns. Interpreting one medium of cultural expression in terms of another – language in terms of percussion – illustrates that neither Laban nor Dada were necessarily interested in the direct carryover of another group's cultural forms; rather, they drew inspiration from the so-called "primitive" neurophysiological level of interrelated movement languages that a Western artist could create within him/herself through an alteration of elemental gesture. That creation would not be like any other primitive culture that had existed before; it would look like an elemental mode of European urbanism that conceived experience in entirely different space patterns. This push for neurophysiological alteration was *entirely* outside any motive to copy primitive art or return to a primeval affective experience of ritual. Neither representational mode was valid, because the space pattern of the Cabaret was different than an African village. No alteration of neural practices could be replicative outside the culture *and readers of Wundt knew it*. Thus, "primitive" connoted a certain neurophysiological orientation, rather than a fine art style, in which elemental coordination among previously distinct movement languages came together in a space of new intensities. These cultures exemplified a certain body logic one had to pursue in his/her own terms. Bringing African rhythms and poetry into the Cabaret sent forth its appropriated rhythms and vibrations into a new integration of movements in a refashioned space pattern. African culture was one aspect of a broader tactical repositioning of communal inquiries of new vibratory creative rhythms, rather than the compartmentalized appropriationist or colonialist encapsulation in which scholars often frame it.

Probing the nature of language as non-syntactic vibrations which connect movement, sound, and word into a single, communicative current made the drum into a metaphor for the sonic nature of language when a speaker divorced from it the denotative signification and retained only the sonic qualities of vocal tonality. This focus on utterance as a non-representational wave of elemental vibration turned language into a primal form of rhythm that, like a drum beat, coursed through the body's most elemental nervous structures. Combining this mixture of tone poems and music with ambulatory gesture intensified the overall neurophysiological mutation promised by a return of cultural expression to a level at which its discordant, raw expressions were more likely to alter the tissues of consciousness in unpredictable but shared fashion. Crucial was the proximity of these expressive modes to movement. In these lights, Dadaist primitivism is more indebted to physiology than negritude. Appropriation changed nothing.

Exemplifying this focus on creating a culture centered on base vibrations, another mode of poetic expression outlined in the manuscript and delivered at this soiree was the *poème de voyelles*, which "reproduces sonorities by several vowels linked simultaneously."[93] Tzara, Ball, and Laban all shared an obsession with vowels and the coordination of different tonalities, extended utterance, and linkages of these vowel sounds into tone poems of variant sonorities. Tzara's *poème de voyelles* were a form of linguistic expression that drew heavily on Laban's uses of vowel exercises in the *Freitanzen* at Ascona, but posited improvisation as the foundational logic of performance itself. The neural levels of primitive techniques were more elemental than traditional bodily orientations to language.[94] Vowel poems were new currents of fixed vibrations in vocalizations of sound gestures. The vowel poem was a different use of movement.

These vibratory frequencies of oral gesture were outside structural archetypes of linguistic denotation. Tonality of vowels made these experiments less abrasive than forays into bruitism. Improvisation on the stage made the rewiring of movement languages entirely more dramatic and drastic. The audience would witness a human subject being remade before its eyes through linkages of vibratory utterance that were the writer's way to "relink primitive technique and modern sensibility."[95] These currents of language, when absorbed as vibrations by the nervous system, were intended to experimentally alter the nature of mental experience.

Another inspiration for Tzara's theories of movementist and vowel poems was his participation in Ball's *Simultan Krippenspiel*, Ball's *Simultan Krippenspiel*, a bruitist nativity play performed by Ball, Tzara, Arp, Janco, Huelsenbeck, and Hennings at the Cabaret on May 31, 1916.[96] Ball's composition of this work likely occurred along the lines of improvisation and experiment and ultimately preserved a great deal of unpredictability outside what was ostensibly a very German presentation of a religious drama. Performance of the work took place entirely behind a backlit, opaque scrim, which playfully turned the performers into living shadow puppets. More importantly, the scrim downplayed any one performer's identity and placed focus on the rhythmic coordination of the group's movements in coordination with spoken language, extended vowel sounds, and noise. The script for Ball's *libretto* overflows with extended vowel intonations. For example, in scene four, an angel laments, "doooooooo" after the entire ensemble dances to a whistled tune. Also, in scene seven, the character playing Mary (likely Hemmings) unleashes a series of drawn out lamentations: "Ahhhhhhhhhhhhhhhhhh!" These moaning sounds follow very similar lamb calls and

trumpet sounds simulated by voice of drawn out intonations: “Taaaaaaaa!” Vocalizations of this sort encapsulated not a synthesis of arts, but a retooling of language into a more elemental current of bodily movement. Dadaists shaped this expressive mode into a baser form of absorptive stimulus. The bodily instrument modified its neural foundations and, ideally, those of the audience.

Ball’s *Lautgedichten* contain similar uses of extended vowel sounds. For example, the ninth line of *Karawane* consists of nothing but a drawn out “ü.” In like fashion, consider the concluding extended vowels of lines five and seven from *Gadji Beri Bimba* that utilize vowel tones as elemental currents of vibratory energy:

> o katalominai rhinozerossola hopsamen laulitalomini hoooo
>
> gadjama rhinozerossola hopsamen
>
> bluku terullala blaulala loooo[97]

Before reciting his poems, Ball had read a brief program note that resembles Tzara’s dismissal of conventional poetic delivery in its expressed need to “give up writing secondhand: that is, accepting words (to say nothing of sentences) that are not newly invented for our own use.”[98] The vibratory, tonal simplicity of vowels and their combination into sonorous exercises of the voice became a way to alter nerves with more elemental stimuli and reaction. Ball had thoughts similar to Tzara’s on the need for a new language of the body, as expressed in the Dada manifesto that he read on July 14, 1916, declaring, “All words are other people’s inventions. I want my own stuff, my own rhythm, and vowels and consonants too, matching the rhythm and all my own.”[99] Ball himself described his linguistic experiments as causing bodily change: “I let the vowels fool around. I let the vowels quite simply occur, as a cat miaows. Words emerge,

shoulders of words, legs, arms, hands of words."[100] Ball's recitations of *Lautgedichten* parallel Tzara's stated intentions for creating new connections of movement between the organs of articulation and those of the limbs. They exhibit a new compositional logic for arranging vowel tones, which he "weighed and distributed solely according to the values of the beginning sequence."[101] Arrangements of these vibratory tones in Ball's work were his experimental endeavor in forging new forms of *Raumgestaltung* and new harmonies of sound gesture.

These forms of poetic expression could also be group endeavors. Tzara's various poetic forms became the raw material for his more complex simultaneous poems. For example, a heavy use of mixed vowel tones appears in his composition "*La fièvre du mâle,*" which the group first performed at the eighth Dada soiree in Zürich on April 9, 1919 (fig. 17). Adding noise to poetry was not just an assault or shock tactic. The nature of noise and tone as currents and pulsations of unconventional nerve energy are framed in Dada writing as embodied experiences, which were meant to directly affect the morphology of nervous tissues and conductive paths. In this fashion, performance sculpted the mind according to a continually changing technique of arbitrary modification.

In this spirit of changing minds through changing nerves, Tzara's pieces for multiple performers often have one or several of the readers disrupting their own recitation with outbursts of percussive noise. For example, the rhythmic intermezzo from Tzara's well-known simultaneous poem "*L'amiral cherche une maison à louer"* (fig. 18), which was first read in the Cabaret on March 30,1916, included accompaniment by drum (Huelsenbeck), whistling (Janco) and rattle (Tzara). This work likely inspired Ball to

include noise in his score for the *Simultan Krippenspiel*, which included the use of homemade bells, noisemakers, and rattles, along with onomatopoeiatic intonations of sound effects by his performers that connected bodily movement to raw sounds in a manner that was immediately linked to the noises of sound poetry. Tzara's participation in these performances informed his multifaceted forays into simultaneous poetry. These diverse forms of vocal performance allowed performers to explore the full scope of language as oral gestures that transmit rhythms.[102]

During his time in Zürich, Tzara continued to investigate the bodily and gestural dimensions of language with a notion of expression he called "cosmic." He expanded on these theories most extensively in his review of *Le Voleur de Talan* by French writer Pierre Reverdy (1889-1960) that appeared in the second issue of *Dada* (December 1917).[103] The cosmic is a particularly intense concentration of multiple and diverse elements in a work which generates the rhythms of its nerve altering creative energy. He defined the concept as a compositional technique in which "multiple, diverse, and distant elements are, more or less intensely, concentrated in the work; the artist gathers [*recueille*] them, chooses them, arranges [*range*] them, makes them into a construction or composition."[104] The notion of the "cosmic" that appears in this text was Tzara's way to frame language as base vibrations through space that would enter the body and shape the nerves.

Tzara was a polyglot, meaning that he likely knew the connotations of an act of arrangement [*Gestaltung*] in the German-speaking arena of Zürich, in which the term connoted a system of new movements in space or *Raumgestaltung*, as in the *Lautgedichten* of Ball, the *Freitanz* of Laban, or the simultaneous poems featuring new

forms of gesture and noise. These types of arrangements filled the performance space with new vibratory energies that rippled through the listener's tissues. In addition to this performative dimension of language as a neural emanation, Tzara sought in this essay to create an overarching notion of *Raumgestaltung* that could incorporate typography, or the arrangement of text on a page, which was itself a major interest of many different avant-garde groups.[105] Tzara believed that in a text, the appearance of the printed word and the polyrhythmic or arrhythmic nature of its syntax could offer its reader a new system of creative movement energies and nervous stimuli. Tzara shared the Dadaist belief that language was an embodied property and that it was organic, a quality that the group saw as connoting an inherent mutability. For him, the cosmic text succeeded when it contained a particularly strong level of arrhythmic or polyrhythmic meter, which would increase the intensity of nervous irritation that a text offered and thereby exude the means of nervous change.

Two general compositional principles constitute the cosmic and the writer must strike a balance between the two in order to avoid the risk of moralizing. First, he or she established equal importance for each object, being, material, and organism in the universe (or in a text). Second, a writer had to stress the human being's importance by grouping around him or her beings and objects, so that s/he may subordinate them to him or herself. Tzara argues that truly cosmic productions contain the first principle as a corrective to the second, which, if gone unchecked, would convey the intention to correct the actions of humans and control them by restrictive pedagogy, as in the Renaissance fascination with anecdotes and moral lessons in art that show humans "trying to go one better than God."[106] Pedantry by anecdote limits action while simultaneously conveying

an illusion of superiority, thus linking traditional humanism to the restrictiveness of *Bildung*.

Tzara's notion of language as an embodied property of nervous emanation came to the fore in his description of Reverdy's text as a generator that floods all corners of the mind with vibrations:

> Le Voleur de Talan *est surtout un radiateur de vibrations et les images qui se déchargent dans tous les coins (effet presque électrique à son passage) se réunissent autour de lui*.[107]

There is a similarity to Tzara's description of Mary Wigman as a vessel of silent vibrations, but in carrying these notions of neural emanation to uses of language, Tzara altered the potentialities of this expressive mode into a phenomenon that could alter the nerves of the reader. Tzara's encounters with dance allowed his review to encompass not only the disjunctive vibrations of language, but also the radical rhythms of typographic arrangement in Reverdy's text itself (fig. 19). Thus, a text becomes a generator of vibrations through its language and the composition of that language on the page, because, as a form of absorptive sensory motion, it had a particular frequency or vibratory rhythm in the nature of its composition or *Raumgestaltung*. These formal qualities offered the possibilities for psychological alteration: reading or simply seeing the arrangement of text on the page triggers absorption of new rhythms through the nerves.[108] Tzara framed both poetry and typography as movement arts, so that the text was meant to physiologically alter the nature of one's own movements and action patterns as reader.[109]

Tzara's philosophy of social reform relied on creating a new state of neurophysiological elementalism, which "places men beside the other elements, just as they are, [in order] to make men BETTER."[110] Succeeding in the creation of a cosmic work relied on connecting the subject to all other elements and subjects in a balanced fashion, so that newly composed non-hierarchical subcollective could "work together, anonymously, on the great cathedral of life we are preparing, to level man's instincts."[111] This decided acknowledgement of the need to improve the quality of human life according to a shared formation of elemental movement pattern had appeared previously in Tzara's "Note 18 on Art," which had opened the first issue of *Dada*. There, Tzara had lauded art that connected humans as though their bodies were all part of a single, pulsing wire. Sharing in new and elemental neural experiences would, he believed, reconnect people below higher levels of intellect and rationalism. Reverdy's text exemplified the social project that Tzara and his friends were seeking, for the rhythm of its prose contained a balanced diversity of discharged vibrations that preserves the distinctiveness of separate discharges creating an intensity of discordant currents that could dissolve prior sensitivity. As Tzara explained, "its episodes are carefully muffled up in a substance with which we are unfamiliar. The collision of its elements is particularly brutal."[112] But for Tzara, this supposed collision was a new form of non-hierarchical balance in experience. He thus connected Reverdy's text to the first, preferred principle of the cosmic and its promise to reforge a subcollective by creating a universe of elementary correspondence between all things.

Tzara closed his review by carefully plotting the tension between an undifferentiated suspension of elemental vibrations and subjective superiority in

Reverdy's text as the means to distinguish the older writer's Cubist practice from his own. For him, the essential difference between the French writer and Dada was the relative position of the subject in relation to the entirety of lived experience:

> [Reverdy] comes close to the first principle in that he does not moralize, because he allows all the elements, *except man*, to appear simultaneously. To art for art's sake, Reverdy opposed art for life's sake. To which we oppose life for the sake of cosmic diversity, for totality, for the universal, and we want to see as innate in the latter the slow life which exists, and even sleeps, in what is usually called death.[113]

These lines suggest two things. First, they offer criticism of French simultaneity as a duplicitous embrace of the supposed flux of life that continues its politically suspect mission of foregrounding the individual artist or poet, who witnesses but does not participate in simultaneously occurring events. Art changed so that life could remain the same. Second, Tzara's alternative of embracing cosmic diversity indicates that practices in the Cabaret Voltaire and Galerie Dada had shown him that realizing truly vital collaborative activity required an initial elementalization of experience, in which previously distinct means of human expression became connected at a raw level as neural processes of movement arts.[114]

How to Make a Constellation

Tzara expanded on the notion of the cosmic in his descriptions of the constellation, or a work of art that has a compositional acumen that exemplifies the search for cosmic harmonies. For example, in his "Note on Poetry," which appeared in

Dada 4-5 (May 1919), he described a constellation as a work that gave "each element its identity, its autonomy, the necessary condition for the creation of new constellations, since each has its own place in the group. The drive of the Word: upright, an image, a unique event, passionate, of dense color, of intensity, in communion with life."[115] "Constellation" is an inherently spatial metaphor. Tzara's continued use of it indicates his interest in the potential of the arts to draw on a common source of mutating nerves that can reconnect a subcollective through a shared experience of elemental energy. For Tzara, a constellation exemplified the cosmic.

The rhythm that arose from this technique was not a progression or a sequence but a continuous tension between movements of addition and association—the form that poetic intensity took when it arose from the grouping of diverse, autonomous, and elemental sound gestures—a live wire of connected gestures and myriad vitalities. The key goal for Tzara was the alteration of one's biorhythmic frequencies of response and intake through a nexus of discordant movement languages. In his above cited "Note on Poetry," he was unequivocal in connecting language to this schema of action: "Rhythm is the gait of the intonations we hear, but there is a rhythm that we neither see nor hear: the radius of an internal grouping that leads toward a constellation of order."[116] Composition appears in these lines in the literal way in which Dada artists understood it at this moment—that is, as a bodily action pattern that has arisen in reaction to the dynamic conditions of a certain space. These concepts of composition from Tzara's nominal note on poetry are properties that can apply to any mode of artmaking that its practitioners convey as a nexus of corporeal movements in space.

For Tzara, the mechanics of linguistic reorientation generate consequences far beyond the composition of poetry:

> A poem is no longer a formal act: subject, rhythm, rhyme, sonority. When projected onto everyday life, these can become means, whose use is neither regulated nor recorded, to which I can attach the same weight as I do to the crocodile, to burning metals, to grass.[117]

This flurry of disconnected images reminds one of either a Dada collage or text and the equivocation is deliberate. Tzara believed that no work should rely on arrangements of iconographic messages, but rather on the ways in which one moved away from frameworks of bodily practice or style in creating associations of these elements. Considering the work as a system of new movements rather than an iconographic message is a shift in focus toward the nervous qualities of altered energy and innervation that came directly from his contacts with dance--especially the *Freitanz*, in which the motions one made altered the mind, rather than illustrated its pre-existent makeup. Tzara proposed a mode of artistic practice in which the qualities of a movement art drew from the heterodox vibrations of everyday life and generate newly expanded space patterns. Images would still appear, but in a non-heirarchical model of suspension or constellation that shifted focus to composition as a quality of innervations and new coordination of conduction in the brain and body.

Considered as a new nexus of bodily motions, the notion of a constellation could be visual or textual. Its energies of composition, considered as nervous vibrations, would place in suspension a series of new movements that would fill the reader or viewer with new sensations of spatial rhythm. The key goal for Tzara was the alteration of one's

biorhythmic frequencies of response and intake through a nexus of discordant movement languages. In his above-cited "Note on Poetry," Tzara could not be clearer as to how language ties into this schema of action: "Rhythm is the gait of the intonations we hear, but there is a rhythm that we neither see nor hear: the radius of an internal grouping that leads toward a constellation of order."[118] Composition appears in these lines in the literal way in which Dada artists understood it at this moment; that is, as a bodily action pattern that has arisen in reaction to the dynamic conditions of a certain space. This notion of composition as an expulsion of nervous energy allows the production or reception of the work to enter the body as a current of vibrations.

Tzara's explosive outlines of language as a rhythmic, internal grouping of elements into a constellation of suspended, undifferentiated discord became a guiding logic for activities of artmaking that carried an intention to alter the nerves of artist and viewer. Conceiving these notions in the realm of plastic art was no great departure, for in Dada, every art was a form of movement art. Criticism from one Dadaist about another often lauded how different frequencies of movement language altered nerves in unpredictable fashion that for painters or sculptors occurred in the process of making an object. For example, in a poem about Janco, both neurophysiology and cosmic harmony are issues for consideration: "*nerfs zigzagués en harmonica cosmique tire tire la ligne à travers feuillage et pauses*."[119] Tzara also tapped into the transparency between the change in artistic practice and the chance in the artist's corpus when he wrote that in Janco's reliefs (fig. 20), "His images live by marvelously dense transparencies and constellations in cut frameworks of surfaces."[120] Likewise, in his essay "Un Art Nouveau," in which he had described Arp's pursuit of new motor ideas, Tzara wrote of

the trajectory from Impressionism to Cubism as undergoing a journey of greater proximity toward the cosmic: "The work moves more and more away from the reality of the world, its level [*niveau*] is always higher, more differentiated, more cosmic."[121] Constellations in a cosmic work of art could be composed of gestures involving plastic media or sound gestures of language.

In any case, and in any media, one loses his/her sense of superiority among all elements—in short, a breakdown between self and space, or self and other. The notion of the text or art object as an elemental constellation that brought one into closer contact with the world as one element among others—i.e., as one mutative circulatory system of dynamic energies among others – rather than a dominating figure, makes any creative act into "a radiator of vibrations" that discharges images in streams of suspended discord. As he described in his "Note on Poetry," work, artist, and viewer would all become new beings:

> To be demanding and cruel, pure and honest towards the work one is preparing and which one will be situating amongst men, new organisms, creations that live in the very bones of light and in the imaginative focus that action will take – (REALITY).[122]

As a more elemental arrangement of oral gesture, language takes on more rudimentary vitality and intensity. It was a practice geared more toward increasing one's feeling of vibrations wrought by gestures in concert with one another, and less about inquiries of signs and symbols. Dada performances were most often collective endeavors, but the nature of group creation that they offered was entirely unlike the ascendant complexities of rhythmic exercises in *Lebensreform* as discussed above or in the previous chapter.

Their artistic practice was neither seamless group formation nor distinct displays of individual talent. Reception of objects, language, or performance was inherently participatory. The criticism and manifestoes would become hymns to these points of contact and alteration.

Collaborating in the Commune: Arp and Taeuber

The notion that chance or improvisation could trigger unforeseen forms of nervous alteration sheds a different light on the importance of chance to Hans Arp, whose collaborative artmaking with Sophie Taeuber drew on awareness of these physiological consequences she knew firsthand from studying with Laban.[123] Arp first met Taeuber at the Galerie Tanner in November 1915, where he had an exhibition with Otto van Rees and Adya van Rees-Duthil. All three artists were staying at Ascona. That Arp regarded the need for a communal, anarchist form of creation is clear in his brief catalogue essay for the show: "No one denies that there are tightrope walkers of different ability. But art is truth and collective truth must become audible above individual truth."[124] Their works plot a new form of embodied community based on shared creation with elemental shapes, forms, and as he described in his memoir *Jours effeuillés*, "new materials unburdened by tradition."[125] In the commune, their works were one element of a newly defined integrated day, in which the shared movement patterns of improvisation altered the nature of everyday life. After all, that was what communes were for: to propagate new forms of moving/being. In this vein, Ball wrote that Arp "assumes here that the images of the imagination are already composites," meaning that the spaces of urban society have trained people to think and move in a certain way.[126] Arp sought an artistic practice that

conjoined reacquaintance with social collectivity while refreshing or regenerating the foundational means of experience and thought.[127]

In association with developing a group out of new and rudimentary sensory and neural experiences, Arp and Taeuber read with great interest the work of Karl Bücher titled *Arbeit und Rhythmus* (1897). They connected to the author's thesis that primitive collectives were based on alternative neurophysiological platforms that gave their culture different means to express rhythm in culture and labor.[128] In positing this notion, Bücher drew directly on Wundt, whom he cited in his text, and whose *Völkerpsychologie* informed Bücher's overall project of connecting labor practice to culturally specific rhythms of vital motion. Bücher's ideas informed pre- and postwar efforts to reform labor throughout Germany, but in an anarchist commune, his work underwent a decidedly alternative reading.[129] Artists in this context understood that a new mode of collective biorhythms could alter the nature of group experience by changing the rhythmic nature of group practice, be it labor or art. This intellectual source enabled the belief that by working to alter the labor and life rhythms of their community, artists could organically create a new form of group experience—their own newly composed *Völkerpsychologie*. In altering the rhythms of labor and other life practices, of which art was one, the group believed it could recompose shared processes of innervation outside of structures they had inherited from spaces of urban modernity that had created the first mechanized war, killed their friends, and pushed them all into exile. However, Arp and Taeuber did more than simply work in the commune while they lived there intermittently. Their Dada activities indicate a far more intense exploration of the mind-altering potentials of new movements away from the concerted reconstitution of all life processes that one found in

the commune. Their interest in the potentials of new and shared forms of motion came from dance.

When Arp and Taeuber learned of Laban's theories, *all movements*—not just artmaking or dance—gained an inter-relatedness in connection to everyday life and immediate space. Group dance gave Arp and Taeuber a particular set of critical tools with which they approached expressive gesture in a manner akin to the techniques of Laban's *Freitanz*, in which new movements of the group alter the consciousness of all involved. In the historical context, this cooperation was connected to a particular anarchist philosophy that motivated an approach to physiological psychology as containing within its discourse the methods of altering the individual consciousness and society in a way that gave individuals a deeper connection to life rhythms. These movements gained intensity in group practice. Thus, Arp and Taeuber applied this model of collaborative, improvisational gesture to the making of objects.

Arp and Taeuber worked together in so many different media that their full range could be the subject of several separate studies.[130] One of the most prominent projects that the two artists worked on together was a group of works known as the *Duo Collages*, produced between 1916 and 1918 (fig. 21). In discussing these works, scholars have described Arp and Taeuber's collaborations as drawing on the desubjectifying capacities of the machine. For example, the artists used a paper cutter in making the squares of paper that they arranged.[131] Yet one could also interpret the *Duo Collages* as a case in point for an alternative reading of Arp and Taeuber's works as a shared experience of improvised gestures. The sharp edges and regularity of the shapes belies the exploratory and spontaneous inquiries of tonal relationships that took place in the process of a work's

construction. Human hands did not cut the paper, but as the artists moved the colored shapes around the surface in concert with one another, they engendered new sequences of motion and coordination, thus creating an improvised series of collaborative gestures that incorporated the body-altering potentials of new movements that Laban's students, including Taeuber, explored repeatedly in their *Freitanz* exercises. The movements were more modest, perhaps, but the goal in both contexts was the same. Cutting the paper with a machine simply made the forms of the shapes more concrete. Arp and Taeuber drew on their awareness of Laban's notions of the psychophysically rejuvenating nature of the movements one undertook in the making of an object, the shaping of its corresponding forms in concert with another artist, and the promise of newly forged movement capacities to alter one's experience of other bodies, sensed forms, and felt space. Working in this manner of experimental movement in the making of plastic objects preserved a certain elemental mode of shared experience that began anew with each collage.

Arp also explored these ideas of creation in work he made on his own. In Hans Richter's oft-quoted description of Arp's "discovery" of chance phenomena, his language connects the event to intentions and qualities of experience that are closely associated to the *Freitanz*:

> Dissatisfied with a drawing he had been working on for some time, Arp finally tore it up, and let the pieces flutter to the floor of the studio on the Zeltweg. Some time later he happened to notice these same scraps of paper as they lay on the floor, and was struck by the pattern they formed.[132]

Scholars have questioned whether these works are actually the products of chance, since many of the shapes appear to have fallen together *too* perfectly (fig. 22).[133] But in the context of dance, a new "pattern" was a new rhythm of motion in spatial configuration that, by definition, required subsequent improvised gestural reaction which brought out its antecedent properties of sensory and spatial arrangement as new neural experiences. In adopting the spontaneous formation of sensations created by a random arrangement of shapes, Arp subsequently improvised within this structure. In doing so, he explored a belief that also appeared in the *Freitanz*—namely, a discovery of a new spatial rhythm or pattern, with which he subsequently interacted. However, making this process into the creative modality of ostensibly finished objects undercut more deliberately progressive models that relied on more concerted programs of nervous rebuilding.

Framing Arp's use of chance as an artistic practice that drew on the promises of neurophysiological alteration also encourages reconsideration of his ink drawings that he made beginning in 1916 (fig. 23).[134] Scholars have taken these works as some of the first examples of abstract or "automatic" art, but considered in the context of a critical approach to physiological psychology as it appeared in dance or reformist movements, neither notion remains compelling.

In relation to this practice, the notion that these drawings are "automatic" is somewhat of a misnomer, for in the context, "automatic" connoted a system of movements that had been developed through repetition into volitionless practices, as one sees the term in the final place of Claparède's diagram outlining the evolution of movement. At the time, automatic movements were far more likely to instance practices of habit, rather than the more common associations one makes today between this notion

and so-called automatic writing or painting in the art of French Surrealists.[135] In order to avoid these misguided projections, it is crucial to consider the notions attached to new forms of improvised movement that existed in the historical context in which Arp made his first ink drawings. He made this mode of spontaneous gesture into a system of artistic practice that he pursued for his entire life; a biomorphism of self and object that operated in accordance with Ball and Taeuber's efforts to make the formal changes of an artwork connect to the neurophysiological changes in the artist produced in the making of that work. One should never forget that Arp made his work in a context where dancers were learning to reuse their hands.

Considered as explorations of ideas surrounding Laban's *Freitanz*, the working method suggests that in his ink drawings, Arp used the embodied sense of chance to continually refresh consciousness through elemental movement patterns. These ink drawings are the graphic manifestations of an improvisational reaction to new sensations of spatial rhythm in a manner that adopted a sense of spontaneous motion as the initiator of nervous alteration from Laban's *Freitanz* exercises into the sphere of drawing. Tzara could not have been clearer in a manuscript on Arp's work that he wrote in collaboration with him. He asserted that in Arp's work, a major grounding concept in the artist's use of chance is "the motor idea in the creation of a work of art is: the search for a level—difference."[136] The motor idea, or mental picture of movements, was a composite of innervation sensations that appeared in the creation of the work, which in this case were spontaneous reactions to spatial sensation in which every work reforged the neural bases of the self.

In his collection of writings published in English as *On My Way* (1948), Arp was more strident, but no less specific, writing: "These pictures are realities in themselves, without meaning or cerebral intention. We rejected everything that was copy or description, and allowed the Elementary and Spontaneous to react in full freedom."[137] The artist's location of volition in the cerebrum instances his assumption that modalities of habitual volition, in which one's actions read as meaningful in relation to habit, have a physiological basis.

In a later text that he included in *On My Way*, Arp described the movements made during the work's creation in terms that drew on concepts of improvised movement in Laban's *Freitanz*, writing, "*I draw and dance at once*, twisting and winding, twining soft, white flowing round."[138] He poetically described the new rhythms of altered innervation within chance gestures that unfolded during the process of drawing:

> All one has to do is lower one's eyelids, and inner rhythm will pass through the hand. In a dark room the flow of inner motion is easier to control . . . The drawing thus loses all its opacity and thus the harmonics, the pulsations, the repetitions, and the metaphor of the melody become the rhythm of a deep breath.[139]

The ostensibly abstract nature of Arp's drawings belie the artist's interest in forging new modes of consonant experience out of discordant, graphic reaction to the irregularities of nature, which had a lawlessness that bespoke a higher reality of freedom.[140] He saw poetry of nature as residing in shapes and forms that occurred outside pre-existent structures of rational thought and creativity. Recalling Ball's statement from his diary that "the notion of law is contradictory to nature," Arp described how improvisational practice was an analogy for the heterogeneous phenomena of nature. Its dynamism and

mutability guaranteed continuous new forms: "We do not want to copy nature. We do not want to reproduce, we want to produce. We want to produce like a plant that produces a fruit and not to reproduce." [141] These movements were the least considered, which made them closest to nature. Chance allowed a return to nature, which enabled the neurophysiological body to create for itself new platforms of movement and expression in a more harmonious relationship to other people.[142] Improvised movement thus became a tool to dissolve the rational outlook toward art as an ascendant projection of normative cultural beliefs and make it the sign of a continually shifting relationship between self and nature, which was a major value of the commune in which Arp lived intermittently during his time in Zürich.

Beginning in 1917, Arp used these ink drawings as models for large relief pieces of cut wood that he painted in vibrant colors (fig. 24). These works were his attempts to make objects that projected spontaneous forms and shapes into new arrangements of spatial rhythm in a manner that altered the interactive nature of the viewer's relationship to the object. Huelsenbeck described Arp's work in terms of these interactions in an essay for the German edition of *Dada* no. 3 (December 1918). He wrote that Arp had "found a dogma where all difficulties are resolved, thus relaxing cramps and spasms."[143] Huelsenbeck's words suggest an outlook toward artistic process that takes full advantage of the increased flexibility promised by improvisation; a sensibility lifted directly from dance. In this text Huelsenbeck framed Arp's work as a movement art, describing how "the painting, with all its colors and forms, goes beyond its stretcher bars [*Keilrahmen*]. It grows arms and hands."[144] Huelsenbeck directly addressed the viewer's absorption of Arp's newly conceived sensations of spatial rhythm when he described the capacity of

the reliefs to relax cramps and spasms. The work has become a fuller expression of the artist's anatomical movements, but the notion that each work has arms and legs suggests that making each work included new and spontaneous movements that altered the artist's neural body. As in Ball's *Lautgedichten*, neurophysiological change in consciousness became a major contributing factor to the ostensibly formal nature of the object. So strong was Arp's practice of chance that his work took on the strengths of an improvised, expressive gesture in space and grew limbs, in a manner that recalls the changes experienced by the "hundred-jointed" Taeuber that occurred during her dancing to Ball's *Lautgedichten*. Arp's work might be understood as a continual reactivation of basic movement energies.

The idea that Arp's work sent rhythms into space was also an interest for the artist himself. When he collaborated with Tzara and Walter Serner on the essay "Dada Art" for the 1920 *Dada Almanach* (edited by Huelsenbeck), the three wrote of Arp, "He wanted imaginative qualities that are not to be found in any museum. As the three describe, Arp was interested in creating "a type of animal-like formation with all its wild intensity and diversities. The creation of a new body outside of us that lives as we do."[145] This notion of biomorphism went both ways.

The neurophysiological consequences of improvised movement in the historical context of Arp's work gave his artistic practice the capacity to contain a notion of gesture that repeatedly triggered change in neural. Chance correlations of movement in artistic practice, described by the artist as drawing and dancing, gave rise to objects that conveyed a tenuous and shifting position for the artist's self, which had undergone neural change in the making of the work. Nominal portraits, like the " natural, superhuman,

massive survival portrait of Tzara" the artist described in a letter to its alleged sitter, was an attempt to capture a dynamic essence of creativity, rather than cement a persona (fig. 24).[146] The form of the work allows the viewer to absorb new intensities of rhythm and neural sequence as heretofore unperceived harmonies that enable a freer range of bodily interaction with the formal rhythms of the piece.[147] Interaction with the object hcnaged the body and made the viewer into one element of a non-hierarchical flow of spatial rhythm. Indeed, this was the intent of the *Freitanz* and of Tzara's notion of cosmic composition. In making plastic objects that conveyed this philosophy of creativity, Arp followed Tzara in making the embodied nature of chance into a program for cultural production.[148]

Tzara's Difficulties in Paris and the Escape to the Alps

Tzara's own hopes for cultural production that he gained from his experiences of physiological tactic in Zürich were certainly powerful, but he would soon have to compete, rather than cooperate, with many more young intellectuals and artists. After Ball's break with Dada in July 1917, he had increased the devotion of the movement to publication, and was likely inspired to do so by the flood of little journals that had appeared in the context of the Paris avant-garde since the nineteenth-century. *Dada* 4-5 signaled increased contact between Tzara and Francis Picabia and began what would briefly become a triumvirate of Paris Dada, consisting of Tzara, Picabia, and Breton's circle around *Littérature*. That relationship was, of course, short lived, but led to Tzara's departure from Zürich for Paris in January 1920.

Considering the French context is a project for another time, but briefly considering Tzara's practices and frustrations in Paris can help frame his departure from the city for the Austrian Alps, where he and Chrusecz spent the summer of 1921 with Hans Arp, Max Ernst, and French Dadaists like André Breton and Paul Eluard, all of whom brought their wives. This reconnection to Arp and meeting Ernst after lengthy correspondence of over two years must have been revivifying for Tzara, especially after his frustrations with the cultural scene in Paris. When Tzara arrived in the city, he found artists whose motives differed categorically from artists like Ball and Arp. Initially, Tzara's activities appeared to fall in line with his demonstrations in Zürich. For example, on May 26, 1920, an audience was treated to *Vaseline symphonique,* a simultaneous poem for twenty voices, which was akin to his poetic demonstrations in the Cabaret Voltaire and the numerous Dada soirees. But for all their fierce demonstrations, Breton and his circle quickly became interested in establishing a countermovement of radical French literature that was decidedly indigenous. Tzara was no longer in a community of exiles.

Tzara's performance at the first public Dada demonstration in Paris signaled his attempt to align himself with this critical outlook toward French culture. He read texts written by French reactionary Léon Daudet that were accompanied by intermittent invasions of noise. This deliberate slap to the face of nationalist politics was Tzara's first attempt to fit into the French avant-garde's attacks on national culture. He was savvy, but his attempts at ingratiation also contained some major missteps. For example, his and Francis Picabia's disruption of the Dadaists' mock trial of Maurice Barres infuriated Breton, whose relationship with Tzara, already strained, was never the same. Tzara's

journalistic fervor had initially inspired Breton to begin the journal *Littérature*, but Breton did not suffer rivalries tactfully.

Tzara's next move was antithetical to the performative spirit of immediacy that he had helped establish in Zürich. In June 1921, he launched a large exhibition of Dada artworks from every major city that had hosted Dada events. While an evening of performances connected to the exhibition on June 10 was a major event, the evening did not bode well for Tzara personally. The night was to culminate with his new play *Le Coeur à gaz*, but its performance only prompted the audience to leave the theatre, rather than riot, as they had done at earlier manifestations of Dada in Paris. Tzara was likely stung by the fact that the only bad publicity was an absence of it. He had arrived in the city a veritable avant-garde celebrity, but within eighteen months, his star was quickly on the decline. In true Parisian fashion, Tzara left Paris in August for a vacation.

Tzara's destination that summer was Imst, a small shepherd village in the Tyrolean Alps. He arrived with Maya Chrusecz and met up with his old friends Hans Arp and Sophie Taeuber. He was also delighted to finally meet Max Ernst, with whom he had exchanged letters, publications, and artworks since November 1919. Ernst's previous experiences that had brought him to Imst were somewhat similar to Tzara's adventures in the international avant-garde in terms of basic disappointments. By the spring of 1920, Dada in Cologne had experienced an entirely upward trajectory of notoriety, but with the closing and brief reopening of the Dada *Vorführung* exhibition throughout April and May of 1920, the main figures associated to Dada in Cologne including Johannes Baargeld, Heinrich Hoerle, and his wife Angelika had all distanced themselves from Dada activities in Cologne. Ernst was likely disappointed, although he tried to joke about it in his letters

to Tzara. His contact with Hans Arp was an essential source of strength during these tempestuous months of shattered alliances. Indeed, it was Arp who had first energized Ernst's efforts to initiate Dada activities in Cologne during the fall of 1919. These contacts with figures from Zürich and the role they played in the complexities of Ernst's intellectual and artistic formation have never achieved proper scholarly attention. These contacts with Ernst are the subject of the next chapter.

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[1] Tzara, "Unpretentious Proclamation," *Anthologie Dada 1919*, repr and trans. In Wright, ed., *Seven Dada Manifestos and Lampisteries*, (London: Calder, 1992), 16.

[2] Erdmute Enzel White, *The Magic Bishop: Hugo Ball* (Columbia: Camden House, 1998), 10. White's text is the best English language biography of Ball. His best friend at this time, Hans Leybold, studied medicine, which almost guaranteed exposure to Wundt's basic ideas on the nervous system—for example, its self-regulatory influences on automatic functions in organs like the heart and lungs. Leybold committed suicide while stationed at the front.

[3] For Reinhardt and Ball see White, Ibid, 64; for Wedekind see Ibid, 66-67.

[4] A very informative period discussion of Reinhardt's studio is found in Huntley Carter, *The Theatre of Max Reinhardt* (New York: Mitchell Kennerly, 1914), 183-184; See also Dalcroze's discussion of applications of his methods in theatre, including those by Reinhardt in *Rhythm, Music, Education* (New York and London: G.P. Putnam'sSons, 1921), 202. See also Ben Halm,

Theatre and Ideology (Selinsgrove, PA: Susquehanna University Press and London and Cranbury, NJ: Associated University Presses, 1993), 124.

[5] Shulamith Behr, David Fanning, Douglas Jarman, *Expressionism Reassessed* (Manchester and New York: Manchester University Press, 1993), 151.

[6] Ball had been to Hellerau in 1913 and had seen demonstrations of Appian theatre in the staging of *The Tidings Brought to Mary* by French poet and playwright Paul Claudel (1868-1955)..

[7] In a letter to his sister Maria Hildebrand of January 13, 1914, Ball writes: Ich war ihm empfohler von Professor Reuschel, Justizrat Bondi, Dr. Dohrnin Hellerau und Rechtsanswalt Benndorf, dem Freund Sternheims." Later in the letter, he praises the ambitions of the Dalcroze Institute: "Ich mochte ausserdem Besuche bei Hegner (Herausgeben der 'Neuen Blätter' in Hellerau). Sowie bei Dr. Dohrn (Hellerau). Dort draussen in Hellerau wohnen die 'Modernsten.'" Hugo Ball, letter to Maria Hildebrand, Janurary 13, 1914, repr. in Ball, *Briefe 1904-1927*, vol. 1, ed. and notes by Gerhard Schaub and Ernst Teubner (Darmstadt: Wallstein Verlag, 2003), 37.

[8] Hartmann had worked with the Ballets Russes in their 1907 production of *Blood Red Flower* and would later become a student of Gurdjieff assisted him in constructing a commune in Essutuki outside Georgia in the fall of 1917 to the summer of 1918, which provided a foretaste of the later Institute for the Harmonious Study of Man built in Fontainbleu. (Chris Webb, *Harmonious Circle: The Lives and Works of G.I. Gurdjieff, P.D. Ouspensky, and Their Followers* (Boston: Shambhala, 1987), 156-162). This project included drawing on a fellow traveler, the Dalcroze instructress Jeanne de Salzmann, wife of the painter Alexandre, for composing what Gurdjieff called sacred gymnastics, which were meant to expose a person to the harmonies within him/herself in relation to the larger harmonies of the cosmos. Ball had no time for this sort of mysticism after the war began, but it is certainly a crucial aspect of the approach to eurhythmics (and its science) that deserves further study in terms of how different figures like Gurdjieff used positivist science in a decidedly mystical way. Gurdjieff, one should recall, was the teacher of P.D. Ouspensky, whose work was a major interest among the Russian avant-garde such as Malevich. For more on Hartmann's relationship to Gurdjieff and Gurdjieff's incorporation of eurhythmics, see Nancy Allison, *Illustrated Encyclopedia of Mind/Body Disciplines* (New York: Rosen Publishing Group, 1999), 258; Whitall Perry, *Gurdjieff in the Light of Tradition* (Hillsdale, NY: Sophia Perennis, 2005), 19-20; For more on Kandinsky in particular see Peg Weiss, Kandinsky in Munich: The Formative Jugendstil Years (Princeton, NJ: Princeton University Press, 1979); *Kandinsky in Munich 1896-1914*, exh. cat. (New York: Solomon R Guggenheim Museum, 1982).

[9] The best source on Ball's contact with Kandinsky is White, *Magic Bishop*, 63-75. The focus of the dissertation prevents a further discussion of Kandinsky's uses of Wundt's theories, but it is clear that the psychologist was a major source for the artist that he combined with other divergent theories of a more mystical tone. One should also remember here that Hans Arp had contact with Kandinsky during this time as well.

[10] Kandinsky's return to Russia in 1914 and his grief at the loss of his friend Franz Marc discouraged any further efforts in the direction of the Blaue Reiter.

[11] Kandinsky, *Concerning the Spiritual in Art* (1911), trans. M.T.H. Sadler (New York: Dover, 1977), 51. These two were, of course, not alone. Other reformers of theatre like Konstantin Stanislavsky, Edward Gordon-Craig, or Georg Fuchs were also working on theories of this kind, though the ideas of each one are very different from each other.

[12] Nicoletta Misler, "Toward an Exact Aesthetics: Pavel Florensky and the Russian Academy of Artistic Sciences," in *Laboratory of Dreams: The Russian Avant-Garde and Cultural Experiment*, ed. John Bowlt and Olga Matich (Stanford, CA: Stanford University Press, 1999), 124. See also John Gage, "The Psychological Background to Early Modern Colour: Kandinsky, Delaunay, Mondrian," in Lynton et al, *Towards a New Art: Essays on the Background to Abstraction* (London: Tate, 1980), 24-37.

[13] Kandinsky, *On the Spiritual in Art* (1911), trans. Michael T.H. Sadler (Boston: Museum of Fine Arts, 2006), 92.

[14] For Kandinsky's knowledge of Steiner and other occultist and spiritist models, see Sixten Ringbom, *The Sounding Cosmos*, (Abo: Abo Akademi, 1970). For Kandinsky's interest in Steiner, and a fascinating discussion of how occultism and anarchism were not mutually exclusive but reciprocal outlooks at this time, see Rose Carol Washton-Long "Occultism, Anarchism and Abstraction: Kandinsky's Art of the Future," *Art Journal* 46 (Spring 1987): 38-45. See also Long, *Kandinsky and Abstraction* (London: Thames and Hudson, 1980).

[15] White, Ibid, 71-72. As Gerald Janacek has recently established, these poets took particular interest in the *Völkerpsychologie*; one that Laban also shared during the time that overlapped with Zürich Dada. Gerald Janacek, *Z@UM: The Transrational Poetry of Russian Futurism* (San Diego State University Press, 1996), 15-21.

[16] Thomas von Hartmann, "Anarchy in Music," in *Der Blaue Reiter*, ed. Kandinsky and Marc (1912), trans. Henning Falkenstein as *The Blue Rider Almanac* (Boston: Museum of Fine Arts, 2005), 116-117.

[17] Nikolai Kulbin, "Free Music," in *Blue Rider Almanac*, Ibid, 141-146. For more on Kulbin see Charlotte Douglas, "Malevich and Western European Art Theory," in Petrova et al, *Malevich: Artist and Theoretician* (Paris: Flammarion, 1991), 58-59.

[18] See notes in introduction. For more on the relationship of Wundt's theories to dissonance, the reader is encouraged to consult the dissertation being currently written by my colleague Lynn Boland on Kandinsky, dissonance, and the Russian avant-garde [title needed].

[19] For basic biographical information on Coray, see *Hugo Ball Briefe*, vol. 3, 148-149. Also Bollinger et al, *Dada in Zürich* , 37-40.

[20] Pestalozzi is often connected to the Weimar Bauhaus as being a main inspiration for the introductory courses at the school. The most informed person on these sources was likely Johannes Itten, who had studied pedagogical theory in Switzerland and had learned of Pestalozzi and Foebel prior to his involvement with the Bauhaus. See Eva Forgacs, *The Bauhaus Idea and Bauhaus Politics* (Budapest: Central European University Press, 1995), 48-49. See also Ellen Lupton and J. Abbot Miller, *The ABC's of Bauhaus: The Bauhaus and Design Theory* (Princeton, NJ: Princeton University Architectural Press, 2000), 4-10. People in the Pestalozzi camp recognized the connection and offered to sell Bauhaus children's blocks through the Pestalozzi-Foebel Verlag. Magdalena Drost, *Bauhaus 1919-1933* (London: Taschen, 2002), 92-93. Josef Albers was another key figure who was aware of these theories. See Frederick Horowitz and Brenda Danilowitz, *Josef Albers: To Open the Eyes: The Bauhaus, Black Mountain College, and Yale* (London: Phaidon, 2009), 84. Unsurprisingly, none of these sources treat the science associated to these theories, which artists like Kandinsky clearly knew.

[21] Hermann Krusi, *Pestalozzi: His Life, Work, and Influence* (New York, Cincinnati, and Chicago: American Book Company Company: 1903), 50.

[22] George Edward Biber, *Henry Pestalozzi and his Plan of Education* (London: John Souter School Library, 1831), 86.

[23] Boring, 250-261 provides the necessary characteristics of Herbart's overall theory of mind. Another excellent source in this capacity is Arens, *Structures of Knowing*, 84-87.

[24] Arens, Ibid, 86.

[25] John Alfred Green, *The Educational Ideas of Pestalozzi* (London: W.B. Clive, 1905), 74.

[26] Auguste Pinloche summarizes this belief: "Pestalozzi will not reason with the children until he has given them a supply of words and expressions, which they learn to apply in their sphere, to combine and to dissect. Therefore he enriches their memory with simple explanations of sensible objects, and teaches the child to thereby to describe what he sees around him, and consequently to

give an account of his presentations, and attain a mastery over them, in now first attaining a clear consciousness of these which were already latent in him." Ibid, 219. See also Thomas D. Yawkey and Anthony D. Pelligisir, *Child's Play: Developmental and Applied* (Hillsdale, NJ: Lawrence Erlbaum, 1984), 261.

[27] Kate Silber, *Pestalozzi: The Man and His Work* (London: Routledge and Kegan Paul, 1960), 30.

[28] The best discussion of this method is by Donna Darling Kelly, *Uncovering the History of Children's Drawings and Art* (Westport, CT: Praeger, 2004): 20-25. An exhibition at the Galerie Coray that ran from May 2 to May 29, 1917 suggests an interest in these ideas of drawing, and though it cannot be confirmed, the drawings may have come from students at the Pestalozzischule. Given that Coray was connected to both places, it is certainly possible. For more on children's art in particular relation to modern art, see Jonathan Fineberg, *The Innocent Eye: Children's Art and the Modern Artist* (Princeton, NJ: Princeton University Press, 1997); Fineberg, ed. *Mit dem Auge des Kindes: Kinderzeichnung und modernsten Kunst* (Hatje, 19915); Fineberg, *When We Were Young: New Perspectives on the Art of the Child* (Berkeley and London: University of California Press, 2006).

[29] Pestalozzi, quoted in Silber, *Pestalozzi: The Man and his Work*, third ed. (London: Routledge and Kegan Paul, 1973), 187. Pestalozzi himself did not design a structured physical education system.

[30] Auguste Pinloche, *Pestalozzi and the Foundation of the Modern Elementary School* (New York: Charles Scribner's Sons, 1912), 219.

[31] For example, Theodor Wiget, in a lengthy article on Pestalozzi's use of Herbart's psychological and physiological theories of education, outlined these associations of training in Pestalozzi's method to then-current theories of physiological psychology: "Wir dürfen die Untersuchung über die physische Bildung nicht beschliessen, ohne endlich noch einer in neuerer Zeit, ebenfalls unter Berufung auf den Satz von den Kenntnissen ohne Fertigkeiten, in Gebrauch gekommenen Dehnung des letzteren Begriffs zu gedenken. Indem man den Sinn jenes Satzes durch Wendungen wie: ‚Das Wissen soll zum Können erhoben werden,' ‚die Kenntnisse sollen sich in Fertigkeiten verwandeln,' wiedergiebt, versteht man unter ‚Können,' ‚Fertigkeit' ein Analogon zu dem, was der Nerventakt auf physiologischem Gebiete ist, namlich die volle Herrschaft über das erwobene Wissen." Theodor Wiget, „Pestalozzi und Herbart," J*ahrbuch des Vereins für wissenschaftliche Pädagogik* 23 (1891), 299. The Society for Scientific Pedagogy was a German language organization who sought to spread Herbartian education reform throughout Germany from the

1870s to the 1920s. See Hermine Maier, *Die Geschichte des Vereins für wissenschaftliche Pädagogik*. (Leipzig: Felix Meiner Verlag, 1940). It is unknown whether Corray belonged to the society, though as director of the *Pestalozzischule* it is certainly possible.

[32] Dalcroze, "Music Teaching in Schools," in *Rhythm, Music, and Education* (New York: Knickerbocker Press, 1921), 21.

[33] Steiner, "Lecture Nine (1924)," *Karmic Relationships: Esoteric Studies, vol. 7* (London: Rudolf Steiner Press, 1973), 135. Steiner argued that Pestalozzi's practitioners misunderstood the metaphysical underpinnings of his methods and was suspicious of their overall materialism. See "Lecture at Dornach, July 24, 1920," *Faculty Meetings with Rudolf Steiner, 1919-1922* (Herndon, VA: Steiner Books, 1998), 114. In relation to this suspicion, Steiner doubted whether the Pestalozzi system could simply be adopted and applied immediately without the realization of the deeper anthroposophical underpinnings of the method. He argued that the "great expectations raised by them have not been filled with their practical application." "Educational Methods Based on Anthroposophy (1921)," *Education and Anthroposophy, vol. 1: Nine Public Lectures, February 23, 1921-September 16, 1922* (Herndon, VA: Steiner Books, 1995), 146.

[34] It helps to remember that a large aspect of Lebensreform was unlike the Turverein of Jahn with its profoundly nationalist orientations, and that the Swiss projects were the clearest instances of this alternative direction.

[35] For more on Scheiblauer see *Hugo Ball: Breife*, vol. 3 (Kommentar), ed. and notes by Gerhard Schaub and Ernst Teubner, (Gottingen: Wallstein Verlag, 2003), 349-350.

[36] Ball, letter to Scheiblauer, dated November 8, 1922, repr. in *Briefe*, vol. 1, 384-385.

[37] Events had become abrasive due to the departure of Ball and Tzara's contact with Francis Picabia, who favored more jarring public manifestations. The protest appeared in *Dada* no. 4-5.

[38] Ball, Critique of German Intelligentsia (1919), trans. Brian L. Harris (New York: Columbia University Press, 1993.

[39] Ball, diary entry dated November 1914, in Ball, *Flight out of Time: A Dada Diary*, trans. Ann Raimes (Berkeley: University of California Press, 1996), 10-11. Subsequent citations are to this edition.

[40] Richard Huelsenbeck, "En Avant Dada," in *The Dada Painters and Poets* (1951), ed. Robert Motherwell (Cambridge: Harvard University Press and Belknap Press, 1989), 39. Gottlob Schenkendorf (1783-1817) was a German poet and patriot who composed patriotic *Lieder* during the German states' participation in the Napoleonic Wars.

[41] Ball, diary entry for October 16, 1915, in *Flight out of Time*, 34.

[42] Ball, diary entry for June 20, 1915, in Ibid, 21.

[43] Ball, diary entry for August 8, 1916, Ibid, 75.

[44] This war experience likely made Zürich Dadaists wary of the Futurist modes of expression, which were inspired by the aesthetic of machines and modern warfare.

[45] Ball, diary entry for September 18, 1916, in *Flight out of Time*, 78.

[46] Marcel Janco, quoted in Annabelle Melzer, *Latest Rage the Big Drum: Dada and Surrealist Performance* (Ann Arbor: UMI Research Press, 1980), 60.

[47] Tzara, "Lecture on Dada (1922)," in Motherwell, ed. *Dada Painters and Poets*, quoted in Melzer, Ibid, 68.

[48] For example, the use of chance appears in the work of Duchamp, about whom artists outside France knew little, save what had appeared in Apollinaire's *Les Peintres Cubistes*, or the later and very similar arguments that scholars often make in connection to the work of postwar artists like Claes Oldenburg or Allan Kaprow.

[49] Art historians have generally omitted studying what Laban's courses were like, what they contained, and what concepts informed the approach to the body that appeared within these courses. One may also consider the manner in which these two groups appeared in the press, which constituted the public face of Dada. When the press reported on events that included Laban's students as Dada artists, the two groups appeared as a single artistic manifestation called "Dada." Tristan Tzara's own collection of press clippings made him fully aware of this fact, as did the other artists reading about their performances in papers published in Zürich. Laban likely paled at this sort of reportage, but Dada clearly did not. The clippings from 1919 are now housed in the Fonds Tzara at the Bibliothèque littéraire Jacques Doucet in Paris. In order to develop this association, I also drew on the collection of clippings amassed by Francis Picabia, which are also stored at the BLJD. I would like to thank Yves Gaonach for his assistance with these materials. Tzara's awareness of how Zürich activities appeared in the press puts to rest any possibility that dance did not matter, or that anyone other than Laban viewed it as separate from Dada: "ferner wird ein Tanz mit dem vielversprechenden Titel "Noir Cacadou" von funf Personen vorgefuhrt . . . Kathe Wulff Gedichte von Huelsenbeck und W. Kandinsky vortragen." *Holzarbeiter Zeitung*, April 4, 1919; "Unter Leitung der Tanzerin Kathe Wulff wird ein dadaistischen Tanz in Masten vorgefuhrt mit bruitistischen Musik." *Neue Zurcher Zeitung*, April 4, 1919; "Auch die abschliesende Tanzauffuhrung – eine Orgie fantastischer Berfleidungen – war ein Beweis dafur, das dass anfangs originell Scheinend einer Manie auf der Dauer unertraglich wird." Berner Tagblatt (April 12, 1919); "Brachtig und ungeheuer waren da gegen schwarze Tanzerinnen in ubermenschlichen Gewandern, und eine ungluckliche und schone Dame musste am clavier

frastlose Tone uben. Ihre Hande und Arme bewegen sich edel und still, und sie wendete das haupt ab." "Zurcher Spaziergange," Le Savoyarde de Paris (April 12, 1919).

The first press release from the Cabaret Voltaire welcomed anyone with new ideas, and staged everything from cabaret singers to Russian folk dances. They often got more than they bargained for, as when a bunch of drunken Dutch students showed up with banjos and demanded some time in the limelight. If the Dada artists were loathe to seeing Laban dancers as fellow Dadaists, then finding them labeled as such in newspaper accounts of the performances would certainly have motivated their exclusion, especially in the case of Tzara, who was obsessed with the public face of Dada. In fact, one only sees increased communication between Dadaists and Laban's students in Zürich. Clearly, this collaborative venture of performance art was not only acceptable, but entirely welcome, and the only separation of these two camps has been the result of a retroactive pairing down of the artistic context in Zürich positions Dada in a vacuum, due to its historical importance in histories of radical art.

[50] Gathering all appearances of Laban dancers in the manifestations of Zürich Dada from 1916-1919 documents the presence this art form had in the midst of an artists' group that was so fascinated with the new potentialities of the rhythmic body and reinforces the presence of dance as providing an intellectual sources for Dada theories of linguistic expression and artistic gesture that they carried into other mediaThe dates that follow are taken from the chronology composed by Raimund Meyer in Bollinger, ed., Dada in Zürich, exh. cat. (Zürich: Kunsthaus and Arche Verlag, 1985), which is to my mind the most comprehensive chronology of Zürich Dada in particular that has appeared to date. A more general chronology of Dada as an international phenomenon, with a useful organization that facilitates cross-referencing, may be found in Dickerman, et al Dada, exh. cat. (Washington: National Gallery of Art and New York: DAP, 2006), 417-458.

Although Dadaists like Arp knew of Laban from his arrival in Zürich, connections between Laban's students and the Dada group grew more intense in February of 1916 when Laban opened a space in the city of Zürich itself that was right across the Limmet river from the Cabaret Voltaire, which itself had also recently been given over to performances by Ball and his friends. Laban's students participated in nearly every Dada performance that featured dance. Shortly thereafter, an evening of dance took place at the Cabaret on March 30, 1916. Another evening on May 31 also featured dancing, as did the first Dada soiree held on July 6. That summer, dance was also part of the program on Ball's ill-fated venture to take his Dada activities on tour through inner Switzerland. July 14, he was back in Zürich for the Dada soiree at the

Zunfthaus zur Waag, which featured ostensibly Cubist dances. September 29, Sophie Taeuber held a party for her two groups of friends that included social dancing and discussions of literature. The year ended with the foundation of a formal gallery space for Dada art and performance when the Galerie Coray opened its doors.

1917 witnessed a more formal approach to Dada as an art movement with its own gallery and publication, although dance only increased its presence, now that the Galerie Coray provided the group with a larger space for its exhibitions, which increased the notoriety of the group and its famous soirees. But friendly socializing was still important to both groups. On March 18, Mary Wigman followed Taeuber in creating a scene where both Laban's students and Dada artists could mingle by having a costume party, which Lucien Neitzel disrupted in playful fashion by reciting poems written by his friend Hans Arp. On March 29, Sophie Taeuber performed an improvised dance to Ball's sound poems and Suzanne Perrottet played modern piano works by musicians like Satie and Schonberg. On April 14, there was more dancing at the "Sturm Soiree," held to celebrate the opening of a new show at the Galerie Coray, recently renamed the Galerie Dada, of artists associated to the German Expressionist circle *Der Sturm*, which was organized around the gallery and publication of the same name run by Herwarth Walden. Ball worked directly with Laban students for a performance at the Galerie Dada on April 14, 1917. A soiree on May 12 featured Arabic dancing, quickly followed by a soiree dedicated to the composer Hans Heusser, which featured dancing by Laban's student Kathe Wulff. Ball's break with Dada began a shift in the sensibility of the movement away from multifaceted performances and more toward abrasive public demonstrations and readings of manifestos by central figures like Tzara.

[51] See, e.g., Melzer, *Latest Rage the Big Drum*, Schall, "Rhythm and Art in Germany," PhD Dissertation (University of Texas, Austin, 1989); Hemus, *Women in Dada*, and Bollinger et al, *Dada in Zürich* . Others who have acknowledged the importance of the relationship between Laban's students and the Dadaists are Dickerman et al *Dada*, 36; Verkauf, *Dada: Monograph of a Movement* (London: Alec Tivanti, 1957), 92; Dorr, *Dancer of the Crystal*, 83; Green, *Mountain of Truth*, 169; Meyer et al, *Dada Global*, 283; and Manning, *Ecstasy and the Demon*, 69.

[52] Hans Richter, quoted in Timothy O. Benson, "Abstraction, Autonomy, and Contradiction in the Politicizatin of the Art of Hans Richter," in Foster, ed., *Hans Richter: Activism, Modernism, and the Avant-Garde* (Cambridge and London: MIT Press, 1998), 27. He was not exaggerating; the Cabaret was only open from early February 1916 to late June of that same year. Aside from the well-known soirees at the Galerie Coray (after March 1917, known as the Galerie Dada) and elsewhere, this and other cafés were the only places where artists from both circles could meet.

[53] "Seit Herr von Laban seine Tanzschule von München 1913 nach Zürich verlegt hat, hat sein Institut an Bewußtsein und Umfang des Studienplans sehr zugenommen. Die Laban-Schule ist heute in notwendiger Ausgestaltung ihres Grundgedankes weit über das hinausgewachse, was eine Tanzschule herkommlicher Art dem jungen Eleven zu bieten hat. Sie hat sich einem Institut entwickelt, das sich nicht nur die Ausbildung des Könnens, sondern schon die Erziehung zum Künstler angelegen sein läßt. Mit der Erziehung zur Persönalichkeit umfaßt sie das ganze Geibiet der Eurhythmie. Es handelt sich nicht mehr um die Technik allein, sondern um die Kunstpädagogik, von der die Ausdruckskultur, in Tanz, Ton und Wort nur de praktische Teil ist. Der Eleve soll neben der Pflege seiner geistigen und physischen Talente auch Gelegenheit erhalten, die Zusammenhange seiner Kunst im rhythmischen und kulturellen Ganzen zu erfassen." *Ball, Über Okkultismus, Hieratik und andere seltsam schöne Dinge*," *Berner Intelligenzblatt*, (November 15, 1917), in *Hugo Ball: Der Künstler und die Zeitkrankheit*, ed. Schlichting, (Frankfurt: Suhrkamp Verlag, 1983), 54-55.

[54] Ibid.

[55] Tzara, "*Carnage Abracadabraut*," *Der Zeltweg* (November 1919), unpaginated, reprinted in *Cabaret Voltaire ; Der Zeltweg ; Dada ; Le coeur à barbe, 1916-1922*, trans. Sabine Wolf and Michael Gluck, (Paris: Éditions Jean-Michel Place, 1981), 78-79. Although it did not come from Zürich , the modest publication Dada Au Grand Air is generally considered to be the last publication by Zürich Dadaists.

[56] Ball, diary entry for May 24, 1916, in *Flight out of Time*, 64.

[57] White, *Magic Bishop*, 131.

[58] Ball, diary entry for June 23, 1916, in *Flight out of Time*, 70.

[59] Ibid, 71.

[60] Ibid, 70.

[61] Ibid, 71.

[62] White, Ibid, 131. Hemus mistakenly dates this event to 1916.

[63] Ball, diary entry for March 30, 1917, in *Flight out of Time*, 102. Arp later claimed that Ball wrote these lines in reaction to Taeuber's performance. When he looked back on Dada, Arp recalled what Hugo Ball, in an unpublished essay "Occultism and Other Things Rare and Beautiful," wrote on Sophie Tauber-Arp's dancing at the Cabaret Voltaire. It is a nexus of physiological gesture processes, mystical overtones, and joyous transgression: "It was a dance full of flashes and fishbones, of dazzling lights, a dance of penetrating intensity. The lines of her body break, every gesture decomposes into a hundred precise, angular, incisive movements. The

buffoonery of perspective, lighting and atmosphere is for her hypersensitive nervous system the pretext for drollery full of irony and wit." Ball,"Occultism and Other Things Rare and Beautiful," unpublished essay quoted by Hans Arp in Arp et al, *On My Way*, (New York: Wittenborn and Schultz, 1948), 40. The essay was posthumously published as "*Über Okkultismus, Hieratik und andere seltsam schöne Dinge*," in Ball, *Der Künstler und die Zeitkrankheit*, ed. By Hans Burkhard Schlichting, (Frankfurt: Suhrkamp Verlag, 1984): 54-57.

[64] He did not structure the ritualistic tonalities in a manner that presented it as a pre-existent, higher end cognitive orientation. It falls outside the scope of this dissertation, but during his time in the Cabaret, Ball seemed to want a form of ritual practice that did not coincide with any prior structure of practice, either spiritually or in terms of gestural custom. Considering how Ball tried to build ritual practice from the gestural ground up, his ultimate perceived failure of this attempt, and his return to Catholicism is a topic for another project. This project could help the art historical conundrum in which scholars are only able to discuss spiritualism when an artist is interested in a pre-existent discursive doctrine, whatever its stripe.

[65] Ball, diary entry for August 13, 1916, in *Flight out of Time*, 76.

[66] Ball, diary entry for April 14, 1916,in *Flight out of Time*, 61.

[67] Ball, diary entry for April 8, 1916, in *Flight out of Time*, 60.

[68] Ball's direct involvement with these notions was short lived. His break with Dada in late May 1917 enabled Tzara to emerge as the key force in promotion and diffusion of the movement and its ideas in printed form. Leah Dickerman is correct in her assessment that Ball was likely resistant to the less immediate notion of Dada as an international, i.e. paper-based movement. These intents to forge communal feeling out of a common physiological platform of nerves come to the fore in the subsequent publications of *Dada* that came out of Zürich. The first issue appeared on July 17, right on the heels of an evening of "*musique et danse nègre*" by Laban's students at the Galerie Dada held on April 14, 1917. This evening which preceded Sophie Taeuber's return to Ascona to continue her study of dance with Laban and his troupe during that summer. Arp visited her frequently during this time, and would eventually spend the entire winter of 1917-1918 on the slopes of Monte Verita.

[69] Tzara, *Note 18 on Art*, May 1917, *Dada* no. 1 (May 1917), unpaginated, quoted in Dachy, op cit, 40.

[70] Tzara, "Chronique Zürich oise," in *Dada Almanac* (1920), Huelsenbeck, ed., repr. and trans. in Green et al, *Dada Almanac* (London: Atlas Press, 1990), 32.

[71] Hugo Ball, diary entry dated March 30, 1917, in *Flucht aus der Zeit* (1927), 102. The event in question was a Dada soiree at the Galerie Dada, which had recently celebrated its first exhibition that had opened on March 17. It is very likely that Mary Wigman's costume ball, at which Arp read poems and at which Sophie danced in a costume by Arp, was scheduled in coordination with the opening as a celebration of the new symbolic home base for Dada events that included Laban's students.

[72] Tzara, "Note on Poetry," Dada nos. 4-5 (1919), repr. and trans in Tzara, *Seven Dada Manifestos and Lampisteries*, trans. Barbara Wright (London, Paris, New York: Calder Publications and Riverrun Press, 1992), 75.

[73] Ibid.

[74] Tzara, "École de danse Laban," *Dada* no. 1 (July 1917), unpaginated, reprinted in Béhar, ed., *Tzara: Oeuvres complètes*, vol. 1 (Paris: Flammarion, 1975), 558-559.

[75] Maja Chrusecz, a student of Laban's who became romantically involved with Tzara from 1916-1922, likely contributed to the richness of his theories that show a correlation between expression and the body, which also carried over into his reception of poetry and the plastic artsThe Fonds Tzara at the BLJD, Paris, contain scores of letters from Chrusecz to Tzara, though none of them put forth any thoughts on art, dance, or expression of any kind. The content is purely personal.

[76] The term has generally received very vague definition. See for example Jeffrey Schnapp, "Bad Dada (Evola)," in *The Dada Seminars* ed. Dickerman and Witkovsky (New York: Distributed Art Publishers and Washingon, DC: National Gallery of Art, 2005), 32-33. Curiously, the ease with which the term can be defined retroactively has fed neglect of the historical context in which the term meant something very specific.

[77] For example, Wundt described the varying speeds of movement in relationship to practice and affirmation of concept: "Die Wiederholung, die grossere oder geringer Geschwindigkeit einer Bewegung, deutet nun ohne weiteres jene Modifikation des begriffs an." "Die Sprache und das Denken," in *Essays*, 2nd ed., (Leipzig: Wilhelm Engelmann, 1906), 300.

[78] French grammatical rules are non-existent in this passage, but a provisional translation could be: "Green necktied toreador under stuffed cakes at the endings of neurological fibers snapping snapping says the poet the stage of heart and Geneva *par excellance* Easter. It is not easy to find velocities of good consciences." Arp, Serner, and Tzara, "Cacadoufarbige," in *Dada* nos. 4-5 (1919), repr. in Behar, ed, *Tzara O.C.*, vol. 1, 495.

[79] In this manifesto, Tzara declares that he "destroys the compartments (*tiroirs*) of the brain." These compartments are categorical, cemented mental function, in which every article of mental

operation has its place. Tzara, "Dada Manifesto 1918," *Dada* no. 3 (December 1918), unpaginated, reprinted and trans in Wright, ed., op cit, 8.

[80] Ibid, 11.

[81] Tzara, "Dada Manifesto on Feeble Love and Bitter Love," first read at Galerie Povolovsky, Paris, on December 12, 1920, repr. and trans. in Tzara, *Seven Dada Manifestos and Lampisteries*, 35.

[82] Ibid.

[83] Ball, diary entry dated March 30, 1916, in *Flight out of Time*, 57.

[84] Tzara, "Unpretentious Proclamation," first read at 8th Dada soiree in Zürich , published in *Anthologie Dada* (1920), repr. and trans. in Wright, Tzara: *Seven Dada Manifestos*, 16.

[85] Laban's work became a source for Tzara and immediately expanded his sense of what free verse could do in a manner that is far more complex than standard arguments ascribing Tzara's innovations to his dependence on French models like Apollinaire or Cendrars, or the *parole in liberta* of Italian Futurism.

[86] Tzara, untitled, unpublished mss., in Fonds Tzara, Bibliothèque Littéraire Jacques Doucet, Paris, reprinted in Tzara, *Oeuvres complètes*, vol. 1, ed. Henri Béhar, (Paris: Flammarion, 1975), 552. According to Béhar, this manuscript is the outline for a lecture introducing the events of the first soirée. Subsequent citations are to this edition, hereafter referred to as Tzara, "*Le poème bruitiste*."

[87] Ibid.

[88] Tzara, "*Le poème bruitiste*," 551.

[89] Tzara, "*Le poème bruitiste*," 551-552. In the lights of his interest in physiological tactic, Tzara's statement that Dada sought to represent intensity was a very knowing contradiction in terms. Focusing on the dynamism of intensity necessitated a continual change in one's physiological platforms that ran utterly counter to any habitually deployed movement pattern of representation. Intensity in its highest levels was a continual re-realization of new nerve paths through improvised movements made during the recitation, rather than a quality that one could retain by static means. Disjunctive combinations of movement languages set forth new rhythms that would alter one's experience by way of the nervous system, in which the absorption of inhabitual intensities would shift nerves to more elementary levels. In contrast to Laban's more focused purpose plays, Tzara's purpose was to whip the audience into a frenzy brought on by unpredictable configurations of voice and movement. Abandoning conventional poetic delivery

emphasized new rhythms of seemingly discordant movement languages. Improvisational gestures of voice and limbs would heighten intensity.

[90] Tzara, "Chronique Zürich oise," expanded version first published in Dada Almanach (1920), ed. Richard Huelsenbeck, repr. and trans. in Green et al, Dada Almanach (London: Atlas, 1990), 21.

[91] Laban, *Life for Dance*, 87.

[92] Ball, *Flight out of Time*, 51.

[93] Tzara, *"Le poème bruitiste,"* 552.

[94] I am here using the French sense of the word "technique," as a system of bodily practices or habits that are associated to particular cultural values. See for example, Marcel Mauss, Techniques du corps

[95]Ibid.

[96] I have relied on White's essential translation based on Ball's original manuscript (in the archives of the Kunsthaus, Zürich), in White, *The Magic Bishop*, 223-227

[97] Ball, *Gadji Beri Bimba*, in White, *Magic Bishop*, 219.

[98] Ball, diary entry for June 23, 1916, in *Flight out of Time*, 71.

[99] Ball, Dada Manifesto (June 1916), in *Flight out of Time*, 221.

[100] Ibid. Emphasis is mine.

[101] Ball, *Flight out of Time*, 70.

[102] In addition to this overall use of vibrations to alter the nervous substrates in collective fashion, one also finds in this work a combination and confusion of English, French and German languages, which implies a failure of nationalist expressive modes and the possible birth of new rhythms and expression that do not rely on a singular usage of conventional communication.

[103] Tzara corresponded with Reverdy and had published poems in the latter's journal *Nord-Sud* in 1917. Gordon Frederick Browning, *Tristan Tzara: The Genesis of the Dada Poem or from Dada to Aa* (Stuttgart: Akademischer Verlag Hans-Dieter Heinz, 1979), 148. For biographical and critical interpretation of Reverdy, see Jean Schroeder, *Pierre Reverdy*, (Boston: Twayne, 1981).

[104] Tzara, "*Le Voleur de Talan* de Pierre Reverdy," *Dada* no. 2 (December 1917), unpaginated, repr. in Tzara, *O.C.* Béhar, ed., vol. 1, 399 and Wright, ed. and trans., 64.

[105] Of course, this is not to say that all avant-garde experiments in typographic manipulation had this same goal, but the notion of language as embodied certainly encourages further study in this direction of examining language as a corporeal property that is inherently mutable, rather than framing it as a Sausseurian structure of archetypes. See for example Johanna Drucker, *The Visible*

Word: Experimental Typography and Modern Art, 1909-1923 (Chicago: University of Chicago Press, 1994); Schwartz, "The Eye of the Expert."

[106] Tzara, Ibid.

[107] Behar's reprint of the above quotation does not match its original wording in Dada; the above quotation is taken from the 1981 facsimile of the original

[108] Reverdy's text becomes a chance for Tzara to argue that the older writer's work realized the younger artist's ambition for the Dada circle "to destroy in ourselves the atavistic sensitivity bequeathed to us by the detestable era that followed the quatrocento." Tzara, "*Le Voleur de Talan* de Pierre Reverdy," in Wright, ed., *Tristan Tzara: Seven Dada Manifestos and Lampisteries*, (London: Calder, 1992), 63. Humanism was a habitual arrangement of nerves. New rhythms would alter these cultural manifestations through the body. Tzara's notion of sensitivity is the basic Wundtian concept describing one's general complexes of nervous organization; the resultant platform of awareness, which, in the review, has undergone rewiring by the vibratory energies of Reverdy's text.

[109] Tzara's take on sensitivity is likely indebted to Laban's orientation of language as one of several movement languages arranged in accordance with the Wundtian model of relative action patterns that rose up in response to variant historical space patterns, which Tzara references in his inclusion of "Negro, Egyptian, Byzantine, and Gothic art" as other examples of non-Renaissance modes of expression, which here read as Rieglian systems of movement language that Wundt and Laban had presented as closer for Tzara as examples of how movement language could be otherwise. Reverdy's text is in the same vein of otherness by becoming an engine of vibrations that penetrate all the spaces of one's mind. Reverdy's text did more than set forth a *frisson* in the reader. As Tzara frames it, the older writer's work has the potential to alter one's consciousness by physiological means.

[110] Ibid, 64.

[111] Ibid, 65.

[112] Ibid, 63-64.

[113] Ibid, 65. Emphasis is mine.

[114] Desire for this more elemental leveling, as Tzara suggests, is not some kind of death drive toward the organic in a Freudian sense, but is a form of vitalist, multi-sensory elementalism of the nervous system that Laban had associated to forms of expression like drum language, or that Worringer had presented as the sensory cognitive platform of non-Western or pre-Renaissance.

These examples of variance from more normative models gave Dada the license to pursue on its own the means of rewiring the collective at the most basic physiological levels.

[115] Tzara, "Note on Poetry," *Dada 4-5* (May 1919), unpaginated, repr. and trans in Wright, ed., *Seven Dada Manifestos and Lampisteries*, 76.

[116] Ibid, 77.

[117] Ibid, 76.

[118] Ibid, 77.

[119] Tzara, "Marcel Janco," *Dada* no. 1 (July 1917), unpaginated, repr. in Tzara, *O.C.* vol. 1, 513.

[120] Tzara, "Marcel Janco et la peinture non-figurative," mss. (1917) in Tzara, O.C., 556.

[121] "L'oeuvre s'éloigne de plus en plus de la réalité du monde, son niveau est toujours plus haut, plus différencié, plus cosmique." Tzara, with Arp, "Un Art Nouveau," c. 1917, in Tzara, *OC*, vol. 1, 557.

[122] Tzara, "Note on Poetry," in Wright, ed., 77.

[123] When Arp fled Paris for Zürich in May 1915, his first stop was Ascona, where his friends Arthur Segal, Otto van Rees, and his wife Adya were staying. While there he participated in various collaborative, often artisanal craft activities, such as designing textiles for others to produce. Arp and the van Rees appeared in a group show at the Galerie Tanner in November of that year, at which he met Sophie Taeuber. After this meeting, Arp and Taeuber began to collaborate on paintings, textiles, sculptures, and collages. Around this same time they met Hugo Ball at a German language bookstore in Zürich. Scholars have generally overlooked the importance of Taeuber's training with Laban as contributing to their use of chance and their broader interest in collaboration There are, of course, exceptions. See Erica Kessler, "Sophie Danse," in Suzanne Page, Erika Billeter, et al, *Sophie Taeuber*, exh. cat., (Paris: Paris Musees, 1989), 43-58; Renee Riese Hubert, "Zürich Dada and its Artistic Couples," in *Women in Dada*, ed. Naomi Sawelson-Gorse (Cambridge and London: MIT Press, 2001), 516-545; Ruth Hemus, *Women in Dada* (New Haven: Yale University Press, 2008).

[124] Arp, catalogue essay at Galerie Tanner, November 1915, quoted in Margherita Andreotti, *The Early Sculptures of Jean Arp* (Ann Arobor and London: UMI Research Press, 1989), 58. As Huelsenbeck wrote about his friend in 1958, "The topic of cooperation as an experience was always present while we worked together in the Dada group, and not only then but also later Arp was intensely interested in it." Richard Huelsenbeck, "Arp and the Dada Movement," in *Arp*, ed. James Thrall Soby, exh. cat., (New York: Museum of Modern Art and Garden City, NY: Doubleday and Co., 1958), 18-19.

[125] Arp, *Jours effeuillés, poèmes, essais, souvenirs, 1920-1965* (Paris: Gallimard, 1965), 327-328, quoted in Margherita Andreotti, *The Early Sculptures of Jean Arp* (Ann Arbor and London: UMI Research Press, 1989), 54.

[126] Ball, Flight out of Time, diary entry for March 1, 1916, quoted in Andreotti, Ibid, 53.

[127] Stephanie Poley has argued that this essay displays a general indebtedness to Kandinsky. Poley, *Hans Arp: die Formensprache im platischen Werk : mit einem Anhang unveröffentilichter Plastiken* (Stuttgart: Hatje, 1978), 109-110. This notion of forming a collective through making new, neurophysiologically altering movements in the individual and collective production of art is a familiar one by this juncture, and it should not surprise that Arp had met Kandinsky in Munich in 1912 and had contributed to the *Blaue Reiter Almanak*, which was probably the place Ball first saw Arp's work.

[128] Schall, Ibid, 224-225. Karl Bücher, *Arbeit und Rhythmus* (Leipzig, G.B. Teubner, 1897).

[129] Thus the anarchist reading of this text differed from its applications in the industrial reforms within the Weimar republic as outlined by Cowan.

[130] For work in this direction, though oriented to a different method, see Bibiana Obler, "Taeuber, Arp, and the Politics of Cross-Stitch." *The Art Bulletin* 91 (June 2009). I would like to thank Dr. Obler for sharing her work with me and discussing it through personal correspondence (Summer 2009).

[131] In certain of Arp's reliefs and some of the turned wood objects, Arp and Taeuber employed the aid of craftspeople. A thorough discussion of this notion may be found in T.J. Demos, "Circulations: In and Around Zürich Dada," October no. 105 (Summer 2003): 147-159; "Zürich Dada: The Aesthetics of Exile," in Dickerman and Witkovsky, eds., The Dada Seminars, 147-159.

[132] Hans Richter, *Dada: Art and Anti-Art* (1964), trans David Britt (London: Thames and Hudson, 1997), 51. Zeltweg was the name of the street in Zürich, where Arp's studio was located.

[133] In fascinating recent studies, the staff in conservation at the Museum of Modern Art, New York, working in coordination with curators, have established evidence for the deliberate nature of these works. See Anne Umland et al, *Dada in the Collection of the Museum of Modern Art* (New York: Museum of Modern Art, 2008), 44-49.

[134] The context of Arp's initial investigations of this working method is entirely other than the form of proto-Surrealist automatism in which scholars often place it.

[135] This question needs more study, but notions of automatism should clearly include the researches conducted by Frederick Myers into mediums and what he termed their "automatic"

processes, which for him connoted a loss of will, but in coordination with the imposition of a will outside the subject. Thus the exterior will described by Myers is not necessarily the unconscious (although Surrealists will claim that), but an instance of telepathic communication. See Myers, *Human Personality and its Survival of Bodily Death* (New York: Longmans, 1903). The relationships between these two notions and the ways in which the French side of physiological psychology affected the Surrealist development of this notion are topics for another project. Arp, one should recall, only used this notion during a time when Surrealist uses of automatism had gained in prominence. This is, of course, not to say that one could find instances of Freudian concept in the context of Zürich , as in, for example, the radical theories of Otto Gross, who was a mainstay on Ascona. For more on the breadth of definitions associated to the notion of "automatic" phenomena, see Robert Brain, "The Pulse of Modernism: Experimental Physiology and Aesthetic Avant-Gardes c. 1900," *Studies in History and Philosophy of Science* 39 (September 2008): 393-417; "Protoplasmania: Huxley, Haeckel, and the Vibratory Organism in Late Nineteenth Century Science and Art," in *The Art of Evolution: Darwin, Darwinisms, and Visual Culture*, ed. Larson and Brauer, (Dartmouth: 2009): 92-123.

[136] Tzara, with Arp, "Un Art Nouveau," undated mss., c. 1917, BLJD, Paris, repr. in Behar, ed., Tzara OC vol. 1, 556.

[137] Arp, *On My Way*, ed. Robert Motherwell (New York: Wittenborn-Schultz, 1948), 40.

[138] Arp, *On My Way*, 52. Quoted in Melzer, Ibid, 68. Emphasis is mine.

[139] Arp, "With Lowered Eyelids," *Arp on Arp*, 341, quoted in Schall, Ibid, 247.

[140] Based on his contact with Taeuber and other Labanites and reinforced by his readings of Nietzsche and Schopenhauer, Arp followed Laban's overtly Wundtian association of chance occurrence as the deepest property of raw nature. Rudolf Kuenzli has argued that Arp's notions of chance and language draw heavily on Nietzsche. See Kuenzli, "Hans Arp's Poetic: The Sense of Dada Nonsense," in *New Studies in Dada*, ed. Richard Sheppard, (Driffield: Hutton Press, 1981): 46-59. Schopenhauer was a favorite of Arp's friend Ball. For example, this diary entry from early 1917: "Schopenhauer has already exposed the futility and lack of reason in unadorned nature." Ball, diary entry for May 5, 1917, in *Flight out of Time*, 110.

[141] Ball, diary entry for October 15, 1916, in *Flight out of Time*, 34; Arp, Ibid, 70.

[142] Arp used chance as a creative foil to a more pervasive logic of bourgeois normativity that, according to the artist, had made distraction into habit to the extent that confidence and calm – the emotive effect of habit – only occurs when one reproduces within oneself the emptiness of urban chaos.

[143] "Die Kunst Hans Arps ist die erste, die nach der Wertanderung der Kubisten ein Dogma gefunden hat, in welchem alle Schwierigkeiten gelöst sind, sowie Krämpfe und Spasmen gelöst sind." Richard Huelsenbeck, "Die Arbeiten Hans Arp," Dada no.3 (December 1918), unpaginated. For Huelsenbeck's retrospective views of his experiences in Dada, most of which focus on his time in Berlin, see Mit Witz,Licht, und Grutze: auf den Spuren des Dadaismus, (Wiesbaden: Limes Verlag, 1957); *Memoirs of a Dada Drummer*, ed.Kleinschmidt, trans. Neugroschel, (New York: Viking, 1974).

[144] Dazu greift es mit allen Farben und Formen aus seinem Keilrahmen heraus. Es bekommt Arme und Hände." Huelsenbeck, op cit.

[145] Alexander Partens, pseudo. for Arp, Serner, and Tzara, "Dada Art," in *Dada Almanach* (1920), ed. Richard Huelsenbeck, trans. Malcolm Green et al (London: Atlas Press, 1993), 93.

[146] "Portrait surhumain naturel et uberlebensgross de tzara." Arp, letter to Tzara, dated May 10, 1921. Fonds Tzara, Bibliothèque littéraire Jacques Doucet, Paris. TZR.C.150. Arp made this work for the Salon Dada at the Galerie Montaigne in Paris in early June of 1921.

[147] One could laud the subject's intellect as the still sentient, compartmentalized locus of these impulses, as Cendrars and Apollinaire had done, or one took the route favored by Laban and respond to these elemental impulses in like fashion by movement, for it was movement, rather than poetic syntax, that best reflected the mental dynamism of the subject's response patterns.

[148] Arp's work relied on chance as the means to suggest this infinite freedom as "a limited part of an unfathomable *raison d'être*, of an order inaccessible in its totality" (*On my Way*, 40). Copy, description, meaning, and intention rely heavily on pre-existent categories of socially validated meaning that the cerebrum plugs into for its connection and reinforcement.

Chapter Five

Dadamax: Process in Motion

The German artist Max Ernst's diverse works contain a critical reaction to physiological psychology with complexities that are unique to his oeuvre. In particular, his contact with Zürich Dadaists that began before the war and continued in earnest during the years of its aftermath introduced him to the ways in which new motions of gesture and association in artistic composition could initiate radical modifications of the body and culture. But unlike Zürich Dada, Ernst's pursuit of these ideas concerning motion contained a far more extensive usage of appropriated visual representations from science texts and pedagogical aids that, once altered and composed into new entities, showed new bodies under mutation. I will argue that his collages from this time have two interconnected techniques of critical approach to physiological psychology and its cultural presence: one that consisted of representation involving found images and one that suggested self-directed pursuit of neurophysiological change with new movements of arrangement involving those images.

Ernst's Contacts with Physiological Psychology and Radical Approaches to It

While Ernst attended college at Bonn from 1910 to 1914, he took courses in psychology, read Wundt's *Grundzüge*, portions of his *Völkerpsychologie*, and learned of general practices in physiological psychology from Wundt's student Oswald Külpe.[1] As outlined in the second chapter, Külpe's work had fallen prey to Wundt's criticism,

founded on the older psychologist's belief that one could not test higher mental functions. Ernst's time in college was very much like the experience of Hugo Ball, who learned of both Wundt and second generation theories of physiological psychology. Also like Ball, Ernst had contact with the *Blaue Reiter* group. In the summer of 1912, he became a good friend of the Expressionist painter August Macke (1887-1914), who introduced the young artist to the theories of Kandinsky, whom he would eventually meet in 1914. The Russian artist's lengthy treatises outlining the ability of new forms to awaken the mind with new nervous vibrations of sense intake would surely have appealed to Ernst, given his awareness of the physiological psychology that comprised a partial source of Kandinsky's intriguing theories. As a young artist, then, Ernst encountered both the orthodox theories of physiological psychology and varying radical receptions and repurposing of it by artists.

Ernst served in the military for nearly the entirety of WWI, suffered minor wounds, and witnessed four years of brutal conflict and bombardments. As part of an artillery division, he was closer than most to the brain rattling explosions of large caliber weaponry. Based on the undeniable trauma of these experiences, Ernst never again embraced the redemptive philosophies of Kandinsky. In his 1942 text, "Some Data on the Youth of Max Ernst," published in the April 1942 issue of *View*, the artist described his time in the military as a sort of waking death, stating that "Max Ernst died the 1st of August 1914. He resuscitated the 11th of November 1918 as a young man aspiring to become a magician and find the myth of his time." The artist was never the same after the war.

Ernst first mobilized Wundt's theories in an ironic fashion during the war in an article from the literary supplement of the *Kölner Tageblatt* that appeared in the paper on January 7, 1917, Ernst presented the entire history of Modernism from Impressionism to Futurism as a series of ultimately misguided forms of embodied experience and expression. He framed styles as changing psycho-sensory platforms or differing modes of *Völkerpsychologie*, writing that any style was "achieved by practice, training the eyes and the motor nerves of the hand, strict exclusion of all memory and association, and above all – technique, training in the craft."[2] For example, Ernst described the ways in which Impressionist technique required that "art and technical adeptness had to become one. Artists became technicians."[3] Impressionism was a fiction that "had to demonstrate and substantiate for the happy moment the momentary stasis of the moving world . . . to grasp it and give it to troubled man. For he does not know the salutary effect of the memoryless opening up of a view, he cannot hold onto what passes away."[4] Grasping this movement in a fashion that fixed it required that Impressionist artists become "sensitively reacting, thoroughly adept cameras."[5] In training the motor nerves of the hand, artists became automatic in the manner of a camera, but like a camera, this embodied mode of practice ultimately generated a fictitious view of the world.

Sensitive reactions and adeptness connote one's gradual adoption of habits that presented a world in a way that downplayed the chaotic nature of everyday life. Impressionism, like photography, was for Ernst an escape from the chaotic flux of the world. Ernst's outline of art movements in this fashion involved critical mobilization of gesture theory and cultural formation from physiological psychology. After the war, he

met artists who had constructed tactical variations on Wundtian theory as the means to shake the foundations of reality itself.

After the armistice, Ernst returned to Cologne, abandoned his university studies, and began to frequent socialist and avant-garde circles. Sometime during the second half of 1918, he met a young law student named Alfred Grunewald, who soon began to publish extremist pronouncements under the pseudonym Johannes Baargeld. The two became fast friends and began working on ways to bring new art to Cologne. In the fall of 1919, they traveled to Munich, met with the artist Paul Klee, and succeeded in borrowing almost three dozen of his works for an exhibition they staged in Cologne. This project is telling, for it shows that although Ernst had a more cynical outlook as a result of his war experience, he did not abandon particular facets of his earlier intellectual life in its aftermath. As a Blaue Reiter artist and veteran himself, Klee's work fell within spheres of interest that were almost entirely outside the boundaries of Dadaist efforts that Ernst and Baargeld began to undertake simultaneously.

Arp was a major inspiration for the forays into Dada by artists in Cologne. Ernst had met him right before the war in 1914 in Cologne. The exact place of their meeting has been the subject of conflicting stories, some provided by the artists themselves. In one version, Arp is attempting to explain Cubism to a combative gallery visitor. In another version, he is simply trying to explain modern art to this person. William Camfield has also raised the likelihood that the two became friends and then visited the large exhibition of the *Deutscher Werkbund* exhibition together, perhaps following Arp's impromptu lesson on modern art. [6] The *Werkbund* exposition in Cologne was arguably the summation of the group's pre-war ambitions of social reform that extended to

branches of the arts like Dalcroze's school in Hellerau and filled Cologne itself with new investigations of architectural space by architects and designers like Henry van de Velde and Bruno Taut (figs. 25-26).[7] During the war, the *Werkbund* philosophy of *Lebensreform*, in which the subject's mental constitution and social place underwent alteration to its neural core, numbered among the discourses that Arp and his friends in Zürich had critically rearranged. These friendships provided Ernst with knowledge of physiological psychology that had a depth akin to Ball's pre-war intellectual context.[8]

Klee himself was apparently the first one to tell Ernst that Arp had been involved in Dada practices, although it is likely that he knew of this fact beforehand, because his wife (at that time, his fiancé) Louise had sent him Dada publications while he was stationed at the front. Throughout the fall of 1919, he met Ball and Hennings while in Munich visiting Klee, began an extensive correspondence with Tzara, and reestablished contact with his old friend Arp.[9] Immediately after the war, Ernst appears suspended between pre-war orientations to art like that of Klee and to more recent and radical experiments in performance and plastic art by the artists of Zürich Dada, and of Arp in particular, who was a frequent visitor to Cologne during 1919.

In reference to the previous study of Zürich Dada, one commonality between these divergent strains of cultural practice concerns the partial reliance of both the Blaue Reiter and the Zürich Dadaists on a critical reaction to physiological psychology, which Ernst had known for nearly a decade by the close of the teens. In fact, this earlier knowledge provided him with a considerable amount of intellectual tools for considering the radical approach to the nervous system that had become a key aspect of Zürich Dada. Ernst's extensive contacts with Zürich take on a new dimension of importance, given the

connections between the artist and this group in terms of a shared critical refashioning of Wundt's physiological psychology.

Despite this common thread of approach to science, other artists found the work of Ernst and Baargeld to be too abrasive for their tastes. The artists' guild in Cologne resisted their attempts to exhibit work within the large autumn salon at the Kölnischer Kunstverein in November of 1919, which resulted in Ernst, Baargeld, and several other artists breaking with the guild to form their own "Gruppe D," which put on an exhibition down the hall from the guild's larger show at the Kunstverein. The proximity of their exhibition emphasized the outsider status that the group sought to convey, which they emphasized with a modest yet polished exhibition catalog titled Bulletin D, which testified to their interests in making both radical art and critical gestures against the broad discourses of physiological psychology and *Lebensreform*.

As discussed below, Ernst's work from this period certainly contains numerous gestures in this direction, but in the *Bulletin D* catalog, it was Baargeld who took center stage in addressing a critical outlook toward reformist movements and the nerve psychology that formed one of its lynchpins. For example, a text that appeared in the catalog by Baargeld, titled "…knocks the warm egg out of the hand," contains jabs at many important artists, including Cezanne, Picasso, and Kokoschka, but another brief reference aligned Gruppe D to the critical approach of Zürich Dada. In the text, Baargeld claimed, "Dr. Rudolf Steiner's coroners joined the international DADA Association."[10] Casting Steiner as an ally of Dada was clearly an ironic move, but for the period reader in the wake of WWI, the connections of *Lebensreform* to the fomenting of prewar nationalism could have appeared to take on a particular sting, given Baargeld's reference

to Steiner's "coroners," a fanciful profession that nonetheless calls to mind the war dead, who appear, albeit obliquely, as victims of some nationalist mass murder. To be sure, this was an insider reference, but familiarity with the prevalence of *Lebensreform* movements like Steiner's gave the period reader a full awareness of Gruppe D's various targets that arise in this text.

Baargeld contributed a visual statement of a similar kind to the large Dada *Vorfrühling* exhibition held in Cologne in April 1920, which resulted in an impressive publication titled *die schammade*.[11] The ink drawing, called *Men/Be Careful Dear Heinz*, immediately recalls a head seen in profile. Moreover, it resembles a physiological median cross-section of the inner cranium, which was generally used to illustrate the arrangement of the brain's different sections and its areas of connection to the spinal cord (fig. 27). Instead of a neatly arranged landscape of cranial organs, however, Baargeld has filled the skull fit to bursting with strident and contradictory machine-like forms and spiraling, wavy lines that resemble springs or waves of energy. The work is a chaotic metaphor of rearranged cerebral anatomy that is strongly connected to Ernst's contemporaneous works in this direction, which are more numerous and far more graphic. Despite these achievements of radical artistic gesture, Baargeld began to distance himself from Dada undertakings after the *Vorfrühling* exhibition, while Ernst began to expand his contacts with Dada artists outside Cologne and Germany itself.

Playing with Blocks

During 1919, Ernst took an odd job at a local *Druckerei* and began to use printer's blocks from the shop in his graphic works, albeit in a collage-like manner. In utilizing

image and text as concrete shapes with independent formal values, he investigated collage on his own terms in pictures such as *Don't Smile* from 1919 (fig. 28). Only instead of found paper, Ernst's blocks produced visual images onto the picture space that the artist often masked and drew over with pencil and pen, which makes the work look like a visual representation of a collage. But Ernst did more than use printed forms as found, simply because that notion—explored by many different artists at this moment—does not encompass the entirety of his process, which featured both found and painstakingly hand-drawn elements.[12]

Ernst's works of combined drawing and block prints that he made throughout 1919 offer some of the most confusing arrangements of materials and markmaking that would appear in the entire Dada movement. Very little in Ernst's work looks like what it actually is: block prints look like pencil lines and vice versa, pencil or pen lines connect seamlessly to printed lines, block prints are masked so that certain contours coincide with others, and so on.[13] Assumed continuity of process in *Don't Smile* is a lure.[14] For example, a shape in the lower left hand corner of the work is a complex orchestration of several different techniques, all of which work to create the appearance of a unified form composed of entirely different processes. The overall contour of the shape is a combination of two different blocks: a U-shaped piece and a Roman numeral I (fig. 29). Ernst merged these forms by masking and coordinating where the contour lines of each shape connect. Thus, letters and other forms made with inked and printed blocks appear at first glance to be the result of hand-drawn marks. This newly created shape appears to have a continuous dimension that unifies its overall form. After finishing this coordinated feat of printmaking, Ernst went back over the printed texture and shaded

portions of the overall shape with pencil in a manner that gave the form a unified cast shadow.

Floor planes and cast shadows suggest light sources and depth. But not all objects in Ernst's drawing have these optical qualities of representation. For example, the horizontal lower case "o" has a cast shadow, but the vertical "o" directly above it has no shadow (fig. 30). This "o" with no shadow does, however, have a form that overlaps. If one follows this tubular structure down to the immediate left of the horizontal "o" with a shadow, then one encounters the tube casting a shadow as well. Ernst's collages often have these disruptions of basic continuity.

These ruses create a game of looking and trickery that is certainly playful, but that also contains a deeper consequence. The detailed nature of Ernst's cultivation of receptive discord does not culminate in a unified reception, but only becomes entangled in visual traps. In the historical context, the focused reception of a drawn line as a sequential, even rhythmic experience, especially in German aesthetics, unfolded in a unified scenario of empathetic engagement. In this conventional scene of reception, the viewer could project ostensibly natural rhythms of his or her life into the formal nature of the work in a manner that allowed him or her to feel that the work concretized the inner life rhythms of the viewer.

These conditions of sensory cognition and emotive fulfillment—tropes like sequence, continuity, or rhythm, which, of course, are also qualities of rational, habitual bodily motion—appear nowhere in the work, but *appear to* on first glance. In *Don't Smile*, Ernst treated distinct techniques of printing or drawing as though these conventional processes were found objects. Apparent seamlessness of form is, in fact, a

heterodox mixture of media and techniques that the artist combined like collaged fragments.

Development of techniques by which the artist conveyed false modes of continuous gesture quickly gave way to new complexities of motion in process. One work, titled *Canalization of Refrigerated Gas* (1919-1920), contains forms that appear printed, but that contain additions in pen and ink that reinforce the contrast of stamped contour lines (fig. 31). For example, Ernst used a drafter's compass to reinforce the circular outlines of the four stamped impressions of the roulette wheel in the upper right of the piece and masked the block so that its inner spokes did not appear, which altered the form of this conventional readymade image. In addition to these alterations, the spring in the lower right corner of the work that sprouts from the bicycle wheel is a carefully drawn line with the same width and appearance as the printed lines of the bicycle spokes. *Canalization* continued Ernst's experiments in conjoining different types of media. In creating nearly indiscernible collisions of different media, he made form an exercise in subtle contradiction.

This work also marked the beginning of what became an important dimension of the artist's critical approach to physiological psychology. Ernst began to draw subtle additions of miniature organs and nerve cells in his work that introduced a representation of bodily change in addition to the pursuit of new experiences through cultivating discordant action patterns. In this work, he carefully drew miniscule organs within the masked centers of the roulette wheel. A heart with its main arterial veins appears in the masked central region of the wheel that is second from the bottom on the left (fig. 32). In drawing these small organs, Ernst retained the conventional color-coding from anatomy

textbooks and charts. The red pulmonary vein, which carries oxygenated blood from the heart, is nestled against the blue pulmonary artery that transports deoxygenated blood to the lungs, which Ernst drew next to an esophagus in the middle of another wheel on the left edge of the picture (fig. 33). Between these wheels that contain heart and lungs, the artist drew dendritic nerve endings, thus giving these tissues conductive structure (fig. 34). Ernst drew other branch-like tubes close to the heart, suggesting some form of circulatory system that connects to the disc in the lower left corner of the piece. These hand-drawn additions give the work a new depth with respect to the artist's reworking of physiology.

Ernst clearly delighted in the punning associations between these images. Arteries, conduction paths, and bicycle wheels are all hollow tubes through which another material circulates. Also, Ernst may have known the categorization of these circulatory organs in medical terminology as transport mechanisms, which is a perfect (though, in this context, very punning) description of a bicycle. In conjoining organs and nerves as physiological transport mechanisms, the functional mobility of the bicycle, and the spinning motion of the roulette wheel, Ernst's analogies spotlighted the basic relationships between humans and machines. However, he has also created a macabre representation in which organs, nerves, and machines are fused into a new entity. In a short time, representation became more complex. During the autumn of 1919, he began to create works that included collaged images of anatomy and physiology, which he often carefully cropped, arranged, and overpainted, resulting in jarring configurations of physiological otherness.[15]

Pathological Anatomy

Ernst's collages of anatomical imagery can certainly be read as orchestrations of shock that condemn the physical and psychological traumas of WWI.[16] For example, the work *Stratified Rocks* (1920) suggests the common sight of partially buried and mutilated human remains and chunks of machinery that appeared in the blasted stretches of "no man's land" between two opposing regiments on a pockmarked battlefield (fig. 35). Experiencing this form of battle caused a newly classified form of psychic pathology known as shell shock. Psychologists and doctors believed that the irrepressible bodily motions of so-called "neurasthenic" subjects conveyed diagnosable manifestations of various psychic pathologies. In scholarship on this period, "pathology" generally connotes an ideology of normativity based on the perception, diagnosis, and confinement of people as subjects who displayed a purported psychic otherness. Within this burgeoning theory of irregular gesture, psychoanalysts argued that the repeated reliving of traumatic experiences and uncontrollable movements among sufferers of shell shock were connected to the same behaviors in patients who suffered from hysteria. These notions of psychic pathology contain the tacit belief that movement always manifested a *pre-existent* psychic state of an individual.[17]

While Ernst's collages may manifest some such content, a far more prevalent meaning of pathology at this moment concerned investigatory dissections of muscular or nervous tissue as part of experimental, psychological inquiry. A large segment of laboratory practice involved cutting through flesh in order to discern how nerves worked. In this context, "pathology" meant a concerted disruption of tissue in modes of inquiry that were not oriented toward the individual, but that centered on establishing neural

phenomena of the species as an experimental method. These pathological methods formed the more extreme end of testing in the laboratories and were part of the same system of practices that included the experiments outlined in the first chapter.

In many different ways, slicing bodies produced knowledge in Wundt's laboratory. Forays into the body and its tissues involved macroscopic dissection of the brain, other organs, or muscle tissue. Any physiological process could provide evidence of possible psychic processes. More experimental than diagnostic, such cutting involved the deliberate introduction of functional disturbance into otherwise healthy tissue as a way to cultivate observable deviation from a pre-existent and normative structural condition. Akin to the dissections of physicians and medical students, these investigatory practices, however, had a deeper significance.

In his *Grundzüge*, Wundt described in no uncertain terms the necessity of such experiments as crucial means of psychological inquiry. Slicing into these organs at the macroscopic level provided "a valuable means of orientation with regard to certain of the wider roads of brain travel."[18] Thought was understood to be based on intraindividual physiological structures that needed mapping. Macroscopic incisions could not uncover the nature of manifold tissues which included "numerous groups of fibers, possessing each a different functional significance," so microscopic dissections sliced the specimen into a series of very thin cross sections, which allowed for closer study of conductive paths and differentiation of function (fig. 36).[19] The majority of illustrations in Wundt's text detailing neural structures or segments of brain tissue were based on repeated practices of dissection and testing.

Physiological psychologists undertook severer modes of pathological inquiry on animal tissue that involved severance of connective tissue or the removal of organs, both of which introduced intense "functional derangement" into the system, allowing for observation of secondary degeneration within areas perceived to have functional relations.[20] One disrupted the system in order to see how tissues ameliorated the trauma. Severance of function in either tissues or organs created two types of observable disruptions in psychological function. First, severing continuity in central or peripheral nerves enabled one to plot subsequent debilitation by observing how nerve fibers display successive stages of degeneration, which were neither cultural nor racial but organic and produced.[21] Second, excising peripheral organs triggered consequent changes in the central nervous organs, which worked to deal with this alteration to its overall structure. Ultimately, any deliberate introduction of pathology to the body allowed psychologists to observe what Wundt called "progressive transformations" in the different tissue systems. These studies became part of a strategy that allowed a researcher to partially uncover the deeper nature of conduction beyond its visible manifestations in movement tests.[22]

Imagery of the body thus had immediate connection to possible psychological meanings with respect to the role body processes played in the processing of immediate experience and the functioning of consciousness. In this context of dominant laboratory techniques, Ernst's selective cutting, shaping, and rearranging anatomical elements was more than just a Frankensteinian game; it actually had a literal side to its connotations that paralleled the practices of physiological psychologists, who used similar techniques on actual tissues as the gateways to higher knowledge of psychological function.[23] In ironically enacting this practice with analogous modes of slicing and excising of Ernst's

images, Ernst's collage practice may be read as a deviant repurposing of pathological anatomy as practiced by physiological psychologists. Ernst located an avenue for the construction of deviant pathologies within pathological anatomy. In amplifying the pathological anatomy of physiological psychology and its deliberately engineered manipulations of the body, Ernst created visual representations of sculpted subjects outside modes of taxonomy.

The previous techniques of cropping, retouching, and masking Ernst utilized in his earlier collages, such as *Don't Smile* and *Canalization of Refrigerated Gas,* provided an established set of artistic practices for visual representations of retooled anatomy, to the extent that these new entities became characters within ambiguous settings and suggested narratives. He became a pathological anatomist of found imagery. Ernst went beyond the basic man/machine metaphors that are such common parlance at this moment, even in his own work. For example, in *jeune homme chargé d'un fagot fleurissant (*1920), the body has become the total object of focus (fig. 37). Flayed and dismembered flesh abounds in the two figures that populate this work on either side of a tree-like form or *fagot* that has begun to sprout tubular organs. After cropping and overpainting the figure on the left, Ernst went back with pen and ink and drew nerve cells that dangle out the figure's neck and arms like a beaded curtain. The artist utilized in graphic form the practices of pathological anatomy in creating representations of neural (and, by consequence, mental) change. In a more famous work, *The Punching Ball ou l'immortalité de buonarroti* (1920), he combined a photograph of himself with a flayed figure from an anatomical chart, which suggests the neuromuscular bases of selfhood and connotes that these tissues of movement were the preferred site of alteration (fig. 38).

Returning to *Stratified Rocks* (1920), the work stands as a demonstration of the increasing complexity in Ernst's restaging of pathological dissections (fig. 36). To create this piece, the artist harvested organs from a diagram of equine physiology and shaped several pieces into new shapes that are sometimes combined with other selected tidbits of flesh.[24] Ernst then drew new structural connections, such as the round U-shaped pipe in the center of the work that connects a colon to a portion of rib cage, or the pulmonary artery and vein that jut off a congealed mass of tissue the artist has carved with a razor into a shape resembling a rosebud. Similar vein forms are present in the slightly earlier *Canalization of Refrigerated Gas*, but *Stratified Rocks* is a more concerted sculpting of anatomy into an entirely new being. For example, he trimmed an image of a small intestine into a shape that closely resembles a brain, then increased the believability of this newly altered organ by placing it next to an image of a spinal column. Ernst subsequently provided instances of progressive transformation by drawing dendritic fronds of neurons in pen sprouting from the brain like feelers on some horrid anemone. The spinal column has begun to undergo its own transformations. It trails a tattered banner of flesh behind its coccyx, out of which new nerve endings have sprouted.[25] In contrast to the buildup of learning in the laboratory use of pathological anatomy, Ernst has taken the introduction of progressive transformation as the sole *raison d'être* of the entire method. He used analogical means in his process to push the transformation beyond any availability for knowledge.

The connotations these cutting exercises had in laboratories made Ernst's venture deeply ironic but decidedly graphic in its pursuit of new mental potentials. In *Sitzender Buddha*, he constructed a mass of cerebral tissue out of heterogeneous representations of

cerebral matter (fig. 39). Ernst took a Coronal plane representation of the frontal brain showing its outer layer of grey matter and its inner ventricles of basal nuclei.[26] The lower left of the work features cross sections of two organs that look like the left and right median Sagittal representations of a cerebellum (healthy humans only have one of these). The hemispherical symmetry of these two shapes contradicts the actual appearance of this organ in the brain, which has neither the symmetry of the cerebral hemispheres, nor the same size as these other tissues. Recently cloned cerebella have sprouted conduction paths leading to a diagram of an elbow joint on the right that has lost its radius.[27]

These confusing games of "name that organ" are, however, made more difficult by the fact that Ernst clearly selected images of cerebral hemispheres and cerebella from diagrams of different scales. When placed together in a new context, these different organs are of relatively similar size as forms. *Sitzender Buddha* is an explosive reconfiguration of psychological function based on a rearrangement of images that provided the foundation of scientific epistemology. Ernst has treated these diagrams like an old-fashioned switchboard and rearranged or added many new paths of conduction.

These two different dimensions of tactic merge in an intriguing fashion in a work that alludes to the body in a manner that is less immediately recognizable than in those previously discussed. Ernst's now iconic work *The Hat Makes the Man* (1920) gives one insight into how complex his critical techniques had become (fig. 40). Imagery in this work is not immediately of the body. Hats and pipes are not body parts like ribcages, brains, and small intestines, yet these forms are anthropomorphic.

Ernst cut a page from a clothing catalogue featuring men's hats along a traced pencil line and pasted it onto a more even sheet.[28] The colored pipe forms were first

drawn in pencil, then painted in gouache, and finally inked around their contours. After pasting the catalogue page, he added four more hats to the bottom stack on the left. Each of these hats is a separate segment of cut-and-pasted paper. Ernst then went back into the image with an eraser and lightly lifted the printing ink from the bowl of each hat, which gave these shapes a unified highlight. He then added a swath of deep black gouache to cover over the cut edge of the catalogue page that runs between the bottom four hats and the top three on the left stack.

Other elements of composition involve the masking of images or parts of images. For example, Ernst carefully painted over and around hat images on the original catalogue page with opaque gesso after he had colored in the pipe forms connecting the hats. Four hats – two in the top left and two to the immediate right of the center stack – are covered with white. This white paint did not serve as a ground for the colored areas of gouache. It soaked into the fibers of the catalogue page, which reduced the intensity of the reflective capacity and gave each pipe form a very similar quality of saturation and refraction. Ernst likely planned the location of the pipe forms. Small dashes of gesso lie under the colored gouache additions and read as highlights on the rounded pipe forms. These different additions to cut-and-pasted imagery engender new modes of visual continuity. The artist may allude to pathmaking in this work according to more abstruse means of punning.

An inscription in the lower right of the collage (fig. 41) locates the viewer squarely within a context, albeit carnivalesque, of physiological psychology:

bedecktsamiger stapel / mensch nachtsamiger wasserformer / («edelformer»)

kleidsame nervatur / auch / !umpressnerven! / (c'est le chapeau qui fait l'homme)

/ (le style c'est le tailleur).

Seed-covered, stacked up man, seedless water former ('*nobleformer*') well-fitting venation also tightly fitted nerves! (the hat makes the man, style is the tailor)

Considering this short text in relation to Wundt's psychology opens a rich dimension of meaning in this work and others from the same period.[29] Ernst's punning use of the German word "*nervatur*," the common term describing venation in any natural form or organism, generally describes root systems or leaf veins, but in this work, the term signifies the branching of the pipe forms in analogical proximity to the venation of nerves as represented in texts like Wundt's *Grundzüge* (fig. 42).[30] Wundt's focus on branch paths and pathmaking were a potent metaphor of unpredictable bodily and mental change that Ernst likely absorbed from his contact with Zürich Dada. For example, in his "Note on Art," published in *Dada* no. 2 (December 1917), Tzara had also tapped into the transparency between the change in artistic practice and the artist's corpus when he wrote that in Arp's work, "*L'organisme est complet dans l'intelligence muette d'une nervure et / dans son apparence*."[31] Ernst's works pursue a similar ambition of creating objects that trigger organic growth through the new movements of composition. Ernst did stop there, however, for his adroit constructions of visual analogy throughout contemporaneous and subsequent collage imagery indicate the resonance of this pun and the layers of meaning quickly developed.

Ernst used a visual analogy to encode this work with reference to pulses or currents of a different sort appear in the top right of the work, where dot and dash patterns within the colored forms between the hats (fig. 43) closely resemble the graphic ciphers of Morse code (fig. 44). These thin lines of transmission may well signify

atmospheric pulsations that travel through space and are metaphors for the vibratory currents that enter the *nervatur* of nerves in the body. Analogical relationships of venation and Morse code to pulsations of nervous energy yield a construct of twitching energy in the work.

Based on the pun between nerve endings and other dendriform structures, leaf or plant formations in Ernst's collages can double as representations of miniature nervous systems or bare, vibrating synapses. The repeated use of images of plant venation in Ernst's collages strongly suggests they were metaphors for the body's unpredictable nervous mutation. For example, connotations of *nervatur* open a new dimension of meaning for the playfully anthropomorphic *Leaf Landscape* of 1920 (fig. 45). Dendritic venation of leaves operates as an analogy of the human nervous system in plant forms that stand oddly erect in a hand drawn landscape. An embroidered bodice covered in leaves emphasizes the transmissibility between seemingly non-anatomical imagery and actual pictures of organs, body parts, and human figures.[32] Ernst delighted in the ability of puns to lampoon the inherent meaning of newly paired terms and ideas. His use of this pun is most apparent in *The Word* (1921), a notorious object that led to Ernst's being charged with public obscenity (fig. 46). Charges were lifted once the artist proved that the nude woman came from a print by national hero Albrecht Dürer. In this collage, Ernst has peeled away the flesh on the figure's right thigh and revealed the *nervatur* beneath of an unknown leafy plant.

Most often, pathological anatomy investigated microscopic regions of *nervatur*. The most extensive changes occurred at a scale beyond the range of human observation within the tissues and nerve cells of the body. In addition to these human phenomena,

many microscopic investigations in physiological psychology concerned studying the movements of microorganisms, which were thought to have immediate connection to the general evolutionary trajectory of consciousness that culminated in humans. Ernst's collages containing images of cells from the same period drew on a separate discursive branch of experimental psychology in a manner that immediately connected these works to his broad critical refashioning of physiological psychology. A large number of the artist's works produced during his time in the Dada movement contain oblique but knowing references to theories of established relations between cell behavior and rudimentary psychic function. As he did in collages that deployed games of pathological anatomy, Ernst created punning titles in connection with altered imagery that infect his artistic production with potent irony.

Cellular Consciousness

Visual representations of cells do not have the immediate psychological connotations as human figures, but these microscopic entities formed a crucial dimension of physiological psychology. In his *Grundzüge*, Wundt made cells the keystone of his entire structure of nervous development among life forms. In the rudimentary reactive movements of protoplasmic reaction, Wundt found what he believed was evidence for the tenet that consciousness "is a universal possession of living organisms, from man down to the protozoa."[33] Reflex movements occured in a subject's chance reactions to unexpected stimuli, and these movements also appeared in the behavior of organisms that were ostensibly far less developed, like amoeba and protozoa (fig. 47). The latter produced forms of motion in protoplasm that Wundt believed were "the results of forces

resident in the contractile substance itself."[34] Whether these base movements of cell fluid or protoplasm were volitional was, however, "beyond the reach of demonstration."[35] Amoeba and protozoa did appear, however, to have demonstrable manifestations of mental activity that were "confined within extremely narrow limits . . . determined by the universal organic impulses only in the very simplest way."[36] Nonetheless, Wundt believed these cells moved in reaction to spatial conditions. Physical conditions to which "the movement of elementary organisms may be referred, is by no means incompatible with the hypothesis of concomitant psychical processes."[37] In short, cell reaction to spatial conditions was the base of all mental function on earth.

Wundt argued that these basic functions deserved consideration by physiologists who studied human subjects, for people "derive processes in our own nervous system from general physical forces, without considering whether these processes are or are not accompanied by processes of consciousness."[38] For Wundt, human minds shared basic movement qualities with all organic life, so that mental processes were based in particular developmental levels of movement systems. Thus, any imagery of cells at this moment immediately connoted a general relationship to this evolutionary trajectory of psychic levels of operation based on the nature of movement the organism manifested.

The contractile nature of protozoa allowed Wundt to posit a complex theory of degrees of consciousness built up over time through an ascendant complexity of movements in the body that triggered the upward complication and growth of the nervous system. Linking psychic activity to movement gave rise to myriad forms of consciousness that were implicated in different "bodily substrates" or *nervatur* of varying complexity. When it came to movement as an indicator of psychic function, Wundt

believed humans had lost total possession of this faculty: they were at the top, but understanding the summit required focusing on the basest life forms. Perceiving consciousness as a possession of all living things led Wundt to posit psychic causality as intersubjective and specific to species.[39] Phylogenies of mental operation based on movement systems made volition (if it even appeared) and the forms of its physical manifestations dependent on a certain developmental level of innervation. Thus, the nature of conscious movement and psychic content relied on the structure of the nervous system and what level of "serial differentiation of function" had been achieved.[40]

Placing the basis of mental activity in protoplasm solved one problem by creating another. Amoeba and protozoa contained protoplasm, but it was also in many different kinds of plant cells.[41] The contractile nature of plant protoplasm made the behavior of its cells superficially indistinguishable from protozoa, which "undergo changes of form from which, in outward appearance, are indistinguishable from the movements of these unicellular organisms."[42] For Wundt, the crucial difference between protoplasmic contractility in plant and amoeba or protozoa was that in plant cells one did not find any "psychological middle term" between a stimulus and a movement.[43] These cells lacked any rudimentary conductive structure in protoplasm that absorbed nervous currents of stimuli. This middle term grew from cell evolution in ways that, in Wundt's time, were still unknown. Germinal layers grew in more highly evolved cells like amoeba or protozoa and displayed separation of the ectoderm (cell wall) and the entoderm (inner cell contents), which indicated rudimentary differentiation of function. At this early evolutionary stage, the ectoderm was thought to both absorb sensation and to respond to it with movement, as seen in, for example, the absorption and reaction of an amoeba.

This unity of function differed from more highly evolved organisms that possessed functional differentiation between nerve and muscle cells. Wundt needed another middle term, and his attention then turned to multi-celled organisms that had neither a spine nor distinct sets of neurons and muscle cells.

The hydra, a microscopic freshwater organism, appeared to scientists as a missing link between amoeba and multicellular organisms that displayed functional differentiation (fig. 48). The hydra featured prominently in the *Grundzüge* as part of a broader discussion and evolutionary framing of the gradual differentiation of nervous and movement function in life forms (fig. 49). For Wundt, this small organism was a key evolutionary link between these two contrasting organisms and modes of nervous reaction, movement, and respective psychic levels. Hydrae possessed what Wundt called "neuromuscular cells," that were like little bits of ectoderm that handled processes of both sensation and reaction.[44] Wundt located in the hydra a complication of evolutionary physiology, in which the functionality of a unicellular organism had become a multiplicity of more complex structures that still displayed a carryover or heredity of this combined structure of response and intake.

Ernst referred directly to these organisms when he included imagery of hydrae in a small work from 1921 called *Farcy Hydropic Parasitic Plantation* (fig. 50). He was likely interested in the nature of these organisms as displaying deeply rudimentary levels of movement and psychic activity. Visual puns abound in this work, which, for example, Ernst has conjoined images of hydrae cells with the word "hydropic," the term for an abnormal accumulation of fluid under a person's skin, also known as dropsy.[45] Swollen tissues were also a symptom of farcy or Glanders, an infectious bacterial disease spread

from animals to humans. During WWI, German soldiers used farcy as part of their arsenal of chemical warfare and infected Russian soldiers' horses with the disease along the Eastern front.[46] These events may have informed another well-known collage from this time, *The Horse; He's a Little Sick* (1920), which is itself a pathological maelstrom of rearranged anatomy (fig. 51). Thus, one finds a basic, albeit patently absurdist, overlap concerning the fluid of dropsy, the freshwater environment of the hydra, and a passing reference to wartime trauma. Other works instance the artist's interest in creating new forms of physiological and psychic function below the level of the human.

References to this overall theoretical structure go deeper in the lengthily titled *The Graminaceous Bicycle Garnished with Bells the Dappled Fire Damps and the Echinoderms Bending the Spine to Look for Caresses* (1921), in which the artist combined imagery of plant cells with references to the rudimentary nervous systems of undersea life (fig. 52). Ernst began this work with a large diagram illustrating mitosis in plants, or growth through cell division. The word "Graminaceous" in the title is a likely reference to the grassy plant that was illustrated in the original diagram that the artist used as his source image. References to plants then move to a context of marine life in Ernst's reference to echinoderms, which (despite Ernst's claim these organisms have spines) are a family of invertebrate ocean creatures including starfish, sea urchins, and sea cucumbers. In addition to hydrae, these were the only other genus of organisms that had a nerve plexus, or what were known as neuromuscular cells in Wundt's time. Ernst's additions to the imagery consist mostly of hand-painted fronds of cilia—machinery of stimulus absorption—around the cell walls of the little organisms in the picture, resembling the additions to forms in *Stratified Rocks* that suggest growth or mutation is

underway. Plant cells that previously moved only with contractile protoplasm have sprouted evidence of neuromuscular cells. After Ernst altered them in new ways, these organisms became psychological middle terms of sculpted deviation that were akin to the artist's refashioning of pathological anatomy on the more anthropomorphic scale of the works previously discussed.

Although these mutations of neurophysiology are outside the human, as new modes of physiological change and movement, these entities are immediately connected to Ernst's uses of more ostensibly human imagery. The artist offered a critical reshaping of the nature of the possible origins of consciousness and a person's mental operation. Microorganisms gradually develop into more complex systems of nerve cells in multicellular organisms that culminate in the nervous system of the human body. It can be a human body or an amoeba, which has movement processes that indicate psychic conditions.[47]

As in the representations of pathological anatomy, describing the alterations made to these images and organisms that give them new appearances and techniques of movement involves reference to a science in which any form of new movement generated consequences of psychological change. Thus, any tactical use of physiological psychology immediately implicates the subject. Ernst's inquiry became a two-sided attack. On the one hand, these collages were pictures of psychophysical alteration and new forms of pathmaking at a microscopic level.

In his critical approach to physiological psychology and in addition to his alterations of pasted images, Ernst disrupted the epistemological structures of these images further by combining representations of diverse scales. One finds various forms

of this investigation: combinations of different representational scales, as in *Sitzender Buddha*; brains sprouting grotesquely oversized dendritic endings, as in *Stratified Rocks*, or the playful weirdness of microscopic mutations wrought by overpainted imagery of cells, like *Graminaceous Bicycle*. As argued above, he also delighted in the analogical overlap, both visual and linguistic, between human nerves and structures outside the subject that displayed the appearance of *nervatur*. This pun fed into his pleasure in combining images of different scales, because it was a quality of visual appearance that one could locate in objects and surfaces of very different sizes and anatomical types.

One gets a sense of how Ernst incorporated both dimensions of this playful anatomy in two related collages: *The Assimilative Threads' Attack Plans Found Out in Time on the Stronghold of Dada, 1:300,000* from 1920 (fig. 53) and the subsequent *Arp Microgramme* from 1921 (fig. 54). Most of the images in *Assimilative Threads'* are diagrammatic cross-sections of magnified bird feathers, which offer a visual pun on the common structures of venation [*nervatur*] in feathers and nerves.[48] Given the scale, Ernst setting is massive, but his unit of measure remains unknown. Despite the source imagery, the representation looks like a close up view of the skin, with magnified representations of hair follicles, which are a person's most extensive tactile sense area. Both hairs and nerves worked like threads [*Faden*] and provided sense data to the brain about the body's surroundings. The title of this work and its layered meanings were likely inspired by critical gestures such as Tzara's well known "Dada Manifesto 1918," published in *Dada* no. 3 (December 1918): "Logic is always false. It draws the superficial fibers (*fils*) of concepts and words towards illusory conclusions and centers."[49] Tzara framed the false logic of rationalism as dependent on fibers leading to centers in the mind, which was a

basic metaphor of nerve fibers leading to the cortex. Ernst presented the body as a microscopic battlefield, on which new gestures move one toward new vistas of consciousness.

Ernst likely meant to include a version of this work in Tzara's ill-fated *Dadaglobe* publication, which he intended as a collection of international Dada works. A prose poem in Ernst's handwriting with the same title as the collage exists in the Fonds Tzara:

> The excitement of the merciful sperm carriers, whose perspective is still biogenetically ordered, has increased to its highest level. Similarly, the further rootedness of the semenbearer's structures entered separately, so that out of them we arrange the following: 1) hurling type 2) fertilization through water 3) brooding 4) overburdening of semen through dadaist burdens, weaker than six great so-called telescopic Dadaists who are considered no longer visible to our unarmed eyes. With the one hand bar the walls, with the other hold the motherdrum the Dadaist and persistent arp in the right foreground make music with their own separate conductors.[50]

Sexuality in these lines is mechanical, categorized, and technical, more like Jarry than Freud.[51] Ernst has taken the notion of the skin as a peripheral neural sense organ and made it into a fantastical battlefield of psychophysical manipulation and mutation far below the scale of the Freudian body. Rootedness, excitement, and vibrations all suggest sexual energy, but also speak to a more allegedly rational science of fleshly alteration of the psyche by means of nerves and improvisational gesture. Mention of the drum in connection to Arp suggests that the artists themselves are drums, or instruments of

emanating vibrations that send currents into the tissues. The artists vibrate in concert with separate conductors or conduction paths that sent vibratory charges of nervous energy.

Ernst's tactical inquiry of the relationship between microorganic nervous function and higher levels of consciousness occurred in his work *Arp Microgramme* that Ernst constructed and sent to Paris for publication in the May 1921 issue of *Littérature*. In the journal, the work appeared next to a poem about Arp that Ernst had written (fig. 54). Above all, the *Arp Microgramme* is a conjunction of pathological anatomy, as seen in the cross sections and microscopic inquiries of psychological function. Here, a collision of different scales undermines the taxonomic nature of the composition, which resembles pedagogical charts that the artist had mined for his collages. A microgram is one millionth of a gram, but Ernst included imagery of fossils, like trilobites and coelacanths, that are much larger, and then placed a heading over the entire representation that places its scale at 1:25,000.

Ernst's ostensible portrait of Arp is, in fact, a highly ironic use of microscopic neural histology: no images of these phenomena appear directly, but the visual analogy is inescapable. Although he used a diverse range of imagery in his *Arp Microgramme*, many of the images are geological cross sections (fig. 55), which closely resemble histological cross sections of neural tissue that had appeared in Wundt's *Grundzüge* (fig. 56). Ernst's pseudo-organic cross sections establish elements of Arp's personality with images that have a very knowing proximity to the median representations in anatomical diagrams from texts like Wundt's *Grundzüge*. For example, in the key to the *Arp Microgramme*, illustration number two of the microgram, two geological cross sections become, in the collage, comparative histological cross sections of tissue that illustrate

different patterns of internal structure that occur during different moments of Arp's sleep. Another geological cross section clearly resembles cross sections of nerves in the dermis, with a corresponding text that this image portrays "yellowstone park he keeps berenice's hair there," a reference to a star cluster associated to the constellation (and astrological sign) of Leo.[52] Fossil images suggest nervous impressions on the tissue of Arp's corporeal structure, or signify that Arp's psychic operations are rudimentary like those of prehistoric life forms. One finds a similar relationship in another fossil image and its corresponding caption, "arp head of hair and the daily sediments of his intelligence."

Again, there is a punning construct between the *nervatur* of fossilized leaf forms and the dendriform structure of nerves that played out in several other works from this period. Here, the association of *nervatur* to the brain is made in exacting fashion, and pathmaking is lampooned by allegorical images of fossils, the most concrete and immovable form of *nervatur* one could locate in the sea of imagery that shows examples of this broad concept. Its form resembles a slightly later textual portrait Ernst published in the *Kölner Tageblatt* that lauded his friend's creativity: "If we take an action shot of a horizontal cross section through his original imagination, we will find there a conglomeration of magic words."[53] But beyond these playful references to constellations, national parks, and trilobites, a deeply critical reaction to physiological psychology and its connections to both microbiology and pathological anatomy is the guiding theoretical force of this collage, which connects it to other major works from this moment.

Pathological anatomy triggered observable neural change with actions of cutting. These were attempts by scientists to introduce more rapid, observable alterations to phenomena of neural function that changed more gradually as a result of new forms of

motion. The imagery of carved organs, new cells covered with cilia, and hodge podges of cerebral imagery suggest a fascination on his part with modifying and confusing the correspondences of neural structures to discursive structures of rational psychological function.

But is that all? In combining images that signified a science which held that new forms of mentality arose from unconventional forms of movement, Ernst suggested phenomena of change that were not necessarily visual, but internal. This critical venture involving imagery can rest alongside what may have been a non-visual foray on Ernst's part into the broader field of potential nervous alteration arising from forms of motion that did not rely on habit. Based on the connections of these images to physiological psychology, it is possible to read his collage practices of association and conjunction as forms of motion that altered the artist's own nervous system and consequently his experience of self and space.

Granted, Ernst never described his process in these terms, but he never wrote on his artistic practice during this time at all, and only ever described it in basic terms of biography later on in his life. There does not exist unequivocal statements from him describing how artmaking could become a means of neural alteration. However, he had access to the writings of Zürich Dadaists, Tzara in particular, in which the notion that art could do such a thing received full treatment and poeticization. Ernst originally intended Tzara as the recipient of many of his most famous works from this period, so perhaps he was grafting a visual dimension onto a theory of composition that was already present in the work of the person to whom he was sending his work.

As Zürich Dadaists expressed in their writings, the potential a work has to alter nerves lay in the opportunity the artist has in creating new systems of arrangement [*Gestaltung*] or energies of motion, if the motions of these arrangements unfolded in a spontaneous or improvised manner. Ambulation of this kind modified the determining neural energies or Kraft of movement and thought. For them, and possibly for Ernst as well, new reactions or interactions in space and the world of objects generated a new experiencing self as one facet of a work's overall meaning.

Although very little in Ernst's work from this time looks spontaneous, the potential to read his compositional techniques as improvisational is certainly extent. His actions of selecting, cutting, and modifying the appearance of found imagery allowed for variation in extent structures of representation and meaning. For example, the work *Canalization of Refrigerated Gas*, already discussed, is closely related to a very similar work from the same period, titled *Vademekum Mobile You Are Warned* (1919) (fig. 57). In comparison to *Canalization*, this work is a variant arrangement of the same blocks and hand-drawn additions. The playful analogies of motion between bodily transport mechanisms and bicycle wheels are now linked to the word *Vademekum*, or a portable reference guide that was popular in German culture at the time. The work expanded upon a playful constellation of meanings that appeared earlier in *Canalization*.

But another form of motion may be at work in the different arrangements found in each piece. Beyond the puns, these works also read as improvisational arrangements [*Gestaltungen*] of similar media that constitute distinct but closely related systems of new motion. As related inquiries of composition that comprised different sequences of gestural arrangement, each piece suggests a further refashioning of the nervous system.

Approaching Ernst's work from this period in such a manner sheds light on the possible reasons for his inclusion of written texts with his work, whether these were lengthy titles or entire poems sent with the visual image to Tzara. In this association, the text offered a new syntactic rhythm of spatial arrangement in a manner connected to the more visual arrangements of found imagery. Thus, it is key to see both image and text as part of the same undertaking and informed by the same basic ideas of neural change. Ernst could have understood language in this manner, because Tzara, the intended recipient of many of these pieces, had written on language and artmaking in this manner in texts that appeared in Dada publications from Zürich that he had sent to Ernst.

Ernst's work form this period thus reveals a great many different approaches to physiological psychology that he undertook alone and in collaboration with other artists. For example, another way in which these two types of expression came together occurred in the project Ernst undertook with the aid of Arp known as *FaTaGaGa*. Based on the ideas of artmaking and language that came out of Zürich, this project gains a new significance with respect to the other work Ernst was making at the same time.

FaTaGaGa

Ernst's *Arp Microgramme* may have been a playful tribute to his friend with whom he had collaborated intermittently during 1920 on a loosely connected group of works known as *FaTaGaGa*, a playful abbreviation of *Fabrication des Tableaux Gasométriques Garantis*.[54] Arp visited Ernst in Cologne twice that year for certain; letters from Ernst to Tzara and André Breton place him there sometime before the end of February, and then a little before November.[55] For these works, Ernst mostly made the collages and Arp provided titles and texts for the newly created images.

Scholars have tended to downplay Arp's role in the creation of the *FaTaGaGa* pieces, generally arguing that since Arp did not contribute very much in the way of visual material, that the objects were not truly collaborative. This claim, coupled with Ernst's contemporaneous claim that the collages could be shown without Arp's texts, has tended to encourage resistance to the notion of shared creation of these works.[56] But the relationship between word and image that existed in the historical context, particularly as established by Wundt and echoed (albeit very differently) in the work of Laban and Zürich Dada, in which language and artmaking were simply alternative dimensions of neural emanation, suggests that the two modes of creation were inseparable. Ernst himself described Arp's poetry in such a manner of poly-sensory qualities in his essay on his friend in the *Kölner Tageblatt*, writing that Arp's use of language was "colorful, precise, sensual, fantastic, and always visual to the point of portrait-like fidelity."[57] The problem with downgrading Arp's involvement in this project is that it contradicts the artists' sense of the interrelated nature of language and artmaking.

Arp composed titles for the collages according to the basic structure of ideas that he had followed in Zürich. As argued in the previous chapter, Zürich Dadaists drew on and heavily reworked Laban's ideas on language in their poetic composition and performance. The Zürich Dadaist emphasis on improvisation had altered Laban's framing of these expressive modes into a powerful system of artmaking that made it a vehicle of continual corporeal alteration. Ernst had created his own particular variation on the method by inserting short poems into the visual field of his collages. These two compositional modes were, in fact, two interrelated *Raumgestaltungen* of movement language meant to disorient the artist and viewer's pre-existent biorhythmic anchors of

rational sensibility. The visual and linguistic aspects of these objects were equally important, because both dimensions held an opportunity to alter the neurophysiological foundations of consciousness with improvised movements—i.e., of visual and material arrangements in collage and new modes of composed sound gestures [*Lautgebärden*] in poetry. The theory of language known to Arp from his awareness of Laban's theories likely informed his and Ernst's interconnections of image and text in the senses these practices had as embodied phenomena.

Arp's only contribution to the visual side of the *FaTaGaGa* production is a telling one that emphasized the mind-altering potentials of improvised expressive movements. He pasted a photograph of Sophie Taeuber stretching into *Physiomythological Flood Picture* (fig. 58), which Spies has established as the first *FaTaGaGa* work.[58] The text Arp composed for this work placed both it and the entire project into a context of improvisational gesture involving imagery and language. His text is a chaotic story involving thieves, crones, and scatological humor, until dancing women like Taeuber, whose photograph appears in the collage, moves in like the wind to save the day: "But through free gymnastics (*freiturnen*) the women move the wind into multi-coloredness. The dadaists spring from this viewpoint, that a bird's foot can damage nothing."[59] *Freiturnen* is a composite term that encompasses Laban's *Freitanzen* activities of exploratory improvisation and Dalcroze's *Turnen* exercises that provided Laban with a major source of inspiration. Laban had previously included improvisational poetry composition as a major element of his free dance exercises. A text written by Ernst for a lost collage that Spies has dated to this moment contains equally playful approaches to rhythmic movement and *Lebensreform*. Written in honor of Ernst's friend Job Haubrich,

the text claims that this individual "invented the elastic gymnasium . . . a dumbbell booklet for physical education teachers . . . guidelines for happy hiking."[60]

Arp's inclusion of Taeuber's image and his reference to shared improvisational movements of the body signaled an interest in making artistic production into a refashioning of physiological psychology. In both dimensions of practice, one finds a sensibility of collage that is corporeal—a composite of spontaneous gestures involving image and sound—and directed toward nervous alteration. Collaborative improvisation had a stronger potential for participants to experience nervous mutation out of newly discordant sequences of gesture. Forging disjunctive sets of gestures in activated space was a central concern for Ernst and Arp's experimental collaboration.

Compartmentalizing the diversity of work Ernst made during this time aids understanding of it, but it is crucial to remember that all of these endeavors were simultaneous. Thus, framing *FaTaGaGa* as being inspired by notions of the *Freitanzen* enriches the playful anarchism of collaborative artmaking and gives these experiments a degree of psychophysical consequence, but this reading also bolsters the potential interest Ernst may have had in these ideas when he made collages on his own. Sharing these works with Tzara guaranteed a viewer who knew full well the consequences of artmaking when its practitioners embraced a sense of gesture informed by the physiological tactic of experimental *Freiturnen*. Arp's poetry often displays an interest in tonal play, which intermingles with Ernst's newly associated gestures of images. Proximity to exercises of dance allowed the project to draw on its philosophy of gesture and collaboration in the artists' deliberate intent to reforge both the experience of making a work and the nature of one's experience.

Doing so hinged on altering the body's *Kraft* or determining energies of motion in spontaneous combination with another. This practice altered the thermodynamic functionality of the nervous system as the means to alter experience. The idea of the nervous system following the laws of the conservation of energy gave critical approaches to it an immediate connection to other scientific fields in which these laws also applied. One aspect of the filed deserves particular focus, because Ernst and Arp's project was an ironic namesake of it.

Gasometry is the activity of measuring or using pneumatically contained gases, and its most famous figure was the pioneering French chemist Antoine-Laurent Lavoisier (1743-1794), who once sat for a portrait by Jacques-Louis David (fig. 59). David's portrait includes the tools of Lavoisier's trade, such as a small gasometer—a vacuum tank that allowed for either the measurement or measured release of a particular gas—and a balloon flask, another pneumatic vessel into which different gases could be fed and synthesized (fig. 60). Lavoisier used two gasometers, far larger than the one in David's portrait, to send oxygen and hydrogen into a balloon flask. This experiment allowed him to demonstrate that water was a combination of these two gases, thus ending millennia of reliance on Aristotle's theory of elements (fig.61).[61] When Lavoisier made his own water, its weight was equal to the collective amount of gas that he had transferred into the balloon flask.

Based on this observation, he composed the thermodynamic law of the conservation of mass in chemical reactions, which stated that in a reaction, nothing is lost or gained; one will simply witness a change in material form. Water, for example, might become steam, or a certain weight of oxygen and hydrogen will create the same weight of

water. Lavoisier also coined the terms “oxygen” and “hydrogen,” based on the function of each element. Hydrogen, for example, was based on Greek words that, translated literally, mean “water former.”

The laws of thermodynamics have applications to almost every scientific discipline, but the manner in which Ernst approached the law of the conservation of energy shows that he caught the analogical overlap between the systems theory of physical chemistry—process like water making steam—and the theories of nervous and mental change of physiological psychology. That law in physiology states that energy cannot be created or destroyed, but only transformed, as in cases of physical activity. In Ernst’s time, physical activity had immediate social applicability, as the sculpting of *Kraft* formed a pillar of *Lebensreform*. In these projects, reformists followed Helmholtz’s application of the law of the conservation of energy to the nervous system, which Wundt had accepted and repurposed in his argument that the nervous system changed shape in accordance with this law as the means to absorb new stimuli. Thus, habitual processes of moving and sensing—experience itself—followed laws of thermodynamics, which, as the basis of consciousness, made rational mental processes coincide with the inevitability of general physical laws.

Works that Ernst made immediately prior to the *FaTaGaGa* collages displayed considerable knowledge of these concepts, which he saw fit to intertwine with notions of physiological psychology in a manner that took broad swipes at the common reliance of these discourses on thermodynamics. Ernst’s repurposing scientific imagery and terminology shows the artist’s clear delight in the humor that these collisions of scientific disciplines could bring to the overall critical thrust of his work. For example, in addition

to notions of physiological psychology already discussed, *The Hat Makes the Man* made direct reference to Lavoisier's discoveries in its inscription discussed above. Ernst's addition of the word "wasserformer"—a literal translation of the Greek root for hydrogen—offers a punning take on the notion of psychological pressure by associating it to the containment of pressurized gas in pneumatic vessels, like the pipes that appear in his collage. Bathroom humor is also never far from these works, and one must remember that "making water" is also slang for urination, and although the correct German phrase for this act is "*Wasser lassen*," given the imagery, the connection of laboratory chemistry and body chemistry is a punning treatment of making water.

Further references to chemistry appear in another work, also from 1920, titled *Hydrometric Demonstration of Killing by Temperature* (fig. 62). Hydrometers were instruments first used by Lavoisier to test the densities of liquids, which changed as they were heated or cooled—perhaps the "temperature" in Ernst's title. As Spies has demonstrated, the images in this work came from a catalogue page advertising instruments that could demonstrate procedures in chemistry and physics (fig. 63).[62] Instruments also formed the basis of epistemology in the laboratories of physiological psychologists and it is likely that Ernst's time in college had included demonstrations of both sets of these gadgets. This catalog may have given Ernst the idea to title the series after a gasometer, though the German term for the instrument—*Gasbehälter*—is not used in any of the works. He preferred the French term *gasometrique*.

This is an important distinction to make, because prior to Ernst and Arp's adoption of the French term, it appeared in early 1919 in Francis Picabia's explosive work *Poésie ron ron*: "at the ministry of the Wrung tablecloth/now one

morning/gasometer smile of beautiful weather/a telegram of fearsome size/round like a blue pancake/made me turn pale."[63] Tzara certainly knew this poem, because drafts of it are in Picabia's letters to him, and Ernst may have received this text along with issues of Picabia's journal *391* that Tzara sent him throughout 1920. These uses of chemical instruments in Ernst's early collages still do not explain the reasons that pre-revolutionary chemistry had such currency as a target of playful criticism that occurred alongside the assault on physiological psychology. These machines and their chemist meant a great deal to the public during the *fin-de-siècle* and for decades afterward. This currency indicates possible reasons for why German-speaking artists were so interested in making reference to a French chemist. Like their Dada friends in Paris, they were seeking to undercut icons of traditional knowledge.

Lavoisier may have died during the Terror, but by 1900, he had become a major symbol of French superiority in chemistry and had a social presence in that country not unlike the reputation of Wundt in Germany. That year, France honored the recent centenary of Lavoisier's death with a special exhibit on him at the *Exposition Universelle* (fig. 64) and unveiled a large statue of him in front of the *Église de la Madeleine* in Paris (fig. 65).[64] At the turn of the century and in the face of Germany's scientific prominence, Lavoisier offered the French a cultural hero, whose instruments embodied the country's scientific ingenuity and authority. Before the emergence of the Curies in 1902, Lavoisier and his gasometers were key pieces of national history bolstering French claims of intellectual and institutional superiority in Europe, WWI, with its birth of mechanized an dchemical warfare, gave the overlap of mechanical and bodily thermodynamics an entirely new validity as the raw material of more critical approaches.

Once he began receiving the *FaTaGaGa* collages, Tzara quickly began peppering his manifestos and plays with references to gasometry, both for its ironic value as a repurposed symbol of French scientific authority and as a playful reference to more Rabelaisian dimensions of body chemistry and overall physiological functionality. These include linking body chemistry and the development of consciousness. For example, in his "Dada Manifesto on Feeble Love and Bitter Love," first read at the Galerie Povolovsky in Paris on December 12, 1920, the term appeared in a vertiginous definition of the movement he helped invent: "Dada is a dog—a compass—the lining of the stomach—neither new nor a nude Japanese girl—a gasometer of jangled feelings."[65] The haywire inclusiveness of Tzara's definition resists any synthesis of characteristics that could provide a sense of unilateral identity for the group of artists who gathered under its name. Nonetheless, partial associations or analogies can be made between, for example, the mention of a stomach and the gasometer. Both can hold gas, but the gases arise from different processes.

Lighthearted associations of a very similar kind appear in one of the *FaTaGaGa* works titled *Here Everything is Still Floating* (fig. 66), for which Arp wrote the following lines: "for the first time ever the rainbow eater didn't show the gut steamer and skeleton fish decided to take off."[66] In this work, Ernst has refashioned the hull of a steamship into a twisted mess of intestines, so that the gas it exudes into the air suggests flatulence, rather than steam. In this collage, mechanical thermodynamics and digestion have become inextricably linked. Another humorous example of associating conversions of matter to human digestion appears in the short text Arp composed for the work *Laocoon*,

another *FaTaGaGa* consisting of a large gob of intestines in a vitrine (fig. 67). His text reads:

> In contrast to the ancients' view of Laocoon, Arp holds the modern view of volvulus, the three priests have stepped out for a wee-wee, while in a manner quite harmless to the visitor the worms in their glass cases go on muddling through.[67]

Ernst and Arp worked in unison and reshaped the anatomical torsion of the classical sculpture *Laocoon and his Sons* (fig. 68) into an allegory of a volvulus, or abnormal twist in the intestine that prevents the body from digesting food and passing waste (fig. 69). Arp's priests who make water continue the trend of bathroom humor in this piece and recall the playful association of hydrogen with urination in Ernst's use of the word "wasserformer" in his collage *The Hat Makes the Man* from this same year. These various referrals to bodily gas or transport mechanisms for waste, such as intestines, created playful analogies between chemical processes of energy conversion in instruments and bodies.

But one may also consider these lighthearted ventures as comprising one piece of Ernst's broader critical exercises in pathological anatomy, in which the physics of the body has been modified in explosive fashion as a way to suggest the creation of new forms of consciousness. Thinking of these works in comparison to Wundt's theory of the evolution of consciousness as being readable through varying complexities of neural systems and associated ambulatory processes raises the thrust of these objects beyond puns between digestion and matter transformation. What kind of mentality would the glop of *Laocoon* possess? The question is darkly humorous but no less potent in its

suggestions of bodily and mental alterity that Ernst had undertaken before he initiated *FaTaGaGa* with Arp.

Ernst (and Arp's) humorous constructs were exercises in pathological anatomy that unhinge the potentials of dissection to provide knowledge of psychological functionality, which both artists understood as shot through with theories of thermodynamic function. Given the context of gasometers in Paris during this time, what might Tzara have thought when these works of "guaranteed gasometry" appeared on his Paris doorstep? That Tzara understood the play on Lavoisier and his instruments is likely, since linking his name as gasometry experiments were not only common knowledge, but were encoded in the rhetoric of French institutional authority. In relation to the additional notions of human thermodynamics from the historical context, as seen in the fascination the two artists had with Taeuber's pursuits of improvisational movement, the neurophysiological foundations of consciousness had an ideological dimension of thermodynamic functionality. Framing the senses or the overall body as following the functionality of an instrument was a trend that did not begin with the avant-garde, but in physiological psychology, which applied laws of thermodynamics—especially that of the conservation of energy—to the behavior of the nervous system, which controlled the senses and provided the basis of consciousness.[68]

In working with these spontaneous configurations of images and language, Ernst and Arp's collaborative venture brought two dimensions of expressive movement into deeper correlation in a manner that was outside convention, but that utilized the scientific laws that formed the bases of alleged normalcy in both bodies and elements. Thus, titling their loosely knit group of works after a thermodynamic instrument gave their

undertaking a great deal of critical mileage. During this time, the body was recognized as a thermodynamic instrument that changed according to laws that one could apply to other physical structures and events.

Tzara's continued interest in viewing the body as a system of pneumatic or thermodynamic instruments appeared in his notorious play "The Gas Heart," which premiered as part of the Dada Salon held at the Galérie Montaigne in June 1921. The title is a fascinating conjunction of a human organ with an engine, for although oxygen passes through the heart in the blood, a *gas heart* suggests something far more mechanical. Tzara's cast of players is its own exercise in pathological anatomy: characters in the play consist of different body parts—eye, mouth, nose, ear, neck, and eyebrow, to be precise—all of which prattle chaotically outside any narrative trajectory. Most of these organs are sense receptors that send data of experience to the brain. In Tzara's play, each character chatters incessantly and nonsensically, sending messages to the audience that never fuses into a sequential narrative.

Considered in the lights of this study, the script reads as an allegory of manifold representation gone awry. Beyond the neural consequence of the performance, a referral to gasometry also appears, further reinforcing that for Dada, these two scientific fields were inseparable. For example, the eye favors the Greek hero Agamemnon's wife Clytemnestra, and unleashes the following confession: "You are beautiful, Clytemnestra, the crystal of your skin awakens our sexual curiosity. You are as tender and as calm as two yards of white silk. Clytemnestra, my teeth tremble. I'm cold, I'm afraid. I'm green I'm flower I'm gasometer I'm afraid. You are married."[69] Making the eye a gasometer—a precision machine—is a characterization that resembles turning the heart into an

engine, which again creates a very particular interface between human and machine based on apparent automatic processes.

These very particular associations between human organs and mechanical or chemical instruments based on partial commonalities of function did not cast the body as an unencroachable mechanism. Rather, in word and image, these manipulations framed the body as an inherently moldable entity. But despite the grand ambitions suggested in the play, audiences in Paris walked out in the midst of the performance, which in that city was a worse insult than disrupting the performance. The uproar he sought did not appear, and Tzara left Paris that summer with a heart already heavy over growing distaste for him among French poets who had once so strongly admired him. It was time to regroup.

Nerves in the Tirol

July 1921 was one of many times in the early 1920s when the avant-garde witnessed a collision between an individualist outlook and a felt need for community that was starting to erode. Exemplifying the puckish manner that he had perfected, Picabia mocked Zürich Dadaists in an issue of his journal *391* called *Le Pilhaou-Thiubaou*. In it, he claimed that he and Marcel Duchamp had invented Dada, which drew the ire of Ernst and especially Arp, who both encouraged a meeting in Tarrenz, a small shepherd community in the Tyrolian Alps, in order to plan a counter-attack. Eventually, Arp, his wife Sophie Taeuber, Ernst, his wife Luise, Tzara, and his companion Maya Chrusecz convened on the sleepy village in August, where they collaborated on the publication *Dada Au Grand Air* (Chrusecz provided the title) as a riposte to Picabia (fig. 70).[70] They

were eventually joined briefly by Andre Breton, his wife Simone, Paul Eluard, and his wife Gala.

These tempestuous months are often compartmentalized according to basic conceptions of avant-garde teleology: Breton, representing the Freudian side, eventually wins out over Tzara's "anti-art" Dada side, which soon fades into relative obscurity. The disappearance of Tzara makes way for the birth of the interest in the Freudian unconscious during the early experimentation of Breton and Phillipe Soupault with automatic writing or the fabled *époque des sommeils*, in which the Paris Dadaists investigated the phenomena of mediums and clairvoyance. This trajectory is a far too simplistic representation of what was, in fact, a highly tempestuous period. One constructive way to expand understanding of this moment in specific reference to Ernst's artistic practice is to consider it in the light of the radical view of eurhythmics and *Lebensreform* that had unfolded in the Cabaret Voltaire and Galerie Dada, in which the experimental alteration of nerve paths had taken center stage as the creative heart and soul of the work.

Several basic facts about this moment establish the likelihood that the radical definitions of movement that had erupted in Zürich and Ascona were still prevalent in the hills of Tarrenz. In the summer of 1921, Tzara was a maelstrom of ambition and wanted to collaborate on a ballet with Ernst, which would likely have drawn on notions of choreography that he and Ball had designed for the Laban dancers at the Galerie Dada a few years before.[71] Ernst's initial experiments in frottage date from this period, and it is likely that the radical theories of movement hatched on the hills of Ascona and exercised

in the Cabaret Voltaire were a source of interest for Ernst and his friends as they gathered together that summer.

These ideas likely informed a collaborative text composed by Tzara, Chrusecz, Arp, Taeuber, Ernst, and Sophie Taeuber (as Armanda Duldgedanzen). Ernst's then-wife Lou is represented by the purported signature of nineteenth century realist painter Rosa Bonheur (1822-1899). This text, of which one page has been lost, and which remained unpublished during the lives of all its authors, was composed on the back of manuscript sheets for a portion of Tzara's "Monsieur Aa" texts. It was likely written with the possibility of its inclusion in *Dada Au Grand Air*:

> [in French]When the slave hunter crosses the desert for the last time and the lightning strike pushes its flower into the stone, Dada cries: *voilà la nature* – it sings the hymn and the hair of our mother nature.
>
> [in German] In the garden bells of nervous lizards, the popes hang. Out of the drip flasks the shivers fall. One, the horse bit on the battens, two the globetrotters in the telephone wires, the mouse daughter glycerine. One, we want the hammer blocks in flannel, with the forced merry-making of winter bunting, when the days have disappeared in a haze into beauty. We want to return to NATURE.
>
> *second page missing*
>
> [in French]…bandages against the harvest and eyes of massacred fish. It is for them that we take off our shirts and moustaches to salute nature. But we put them back on when it rains mouldy Spaniards.
>
> [in German] Down with the compact majority of the ladies' tailors!!!! We want to cook nature in fire. Long live nature in its monthly production.[72]

The text itself is a rather unique instance of textual collaboration between Laban dancers and Dada artists like Ernst, who did not participate in Zürich events, but whose participation in this undertaking (more than half of the original manuscript is in his handwriting) could indicate an interest in exploring artistic creation as a collective form of elemental gesture language with overt tones of improvisation and chance response—one that he had explored a few months earlier in a different form with Arp.

The return to nature called for in this text recalls the pursuit of this phenomenon on Ascona, in which communal forms of life and artistic expression were prominent practices. More specifically, artists believed that a purer form of natural existence could arise through a sharing of elemental gesture patterns. In the overarching context of anarchism, the feeling and practice of elemental movements in a collective withheld the habitual self-projection one found in more conventional forms of artistic practice. One instead joined a collective connected by newly forged paths of nervous energy that was akin to the metaphor of the telephone wires in the above text.

In addition to some playful collaborative poetry by Ernst and Arp that they referred to as *FaTaGaGalied*, texts by Parisian Dadaists, and the inevitable potshots at Picabia, Tzara included an intriguing text attributed to his alter ego, Monsieur Aa, *antiphilosophe*, in which the bodily nature of language as a form of gesture takes center stage. *Dada Augrandair* continued the interest among Tzara, Ernst, and Arp in approaching language and artmaking as forms of body altering movement. In this text, Tzara sought to establish the consequences of a bolder, anti-conventional use of language in which one pursues creation with full awareness that new uses of language will alter one's physiological platforms of experience and fleshly ways of knowing.

Tzara is unequivocal concerning the depth that conventional language will control one's corporeal platforms, but he is also boldly hyperbolic concerning the potential of the body and its nervous structure once it is refashioned: "Cowardice knows its order; it is the weight of fear we carry entirely in the nuclei of the bones. Oceanic nerves are the rails of fervent wind."[73] One had to forge new linkages of creative currents through a new use of language in its understood structure of anatomical alteration that would separate itself or deviate from the "malaise fixed by the anonymous collectivity in a word – and the sentimental signification that it hides."[74] Tzara located the impersonal nature of conventional collective representations that have ascended from the group to its market structures and argues for a retooled use of language as a form of movement that will alter the body and make its nerves vast and oceanic. He played fast and loose with traditional anatomy and physiology in these lines, but the point is clear. Cowardice of expression, the fear one has to strike out into uncharted expressive waters, results from and reinforces a form of internal constitution, down to the very cells of the bones. The curse of convention is bodily. Every use of it strengthens the connective tissues that enable its end result. It is within a person, but below his or her levels of awareness.

Ernst's visual contribution to *Dada Augrandair*, an astonishing collage called *The Preparation of Bone Glue*, echoes sentiments expressed in Tzara's essay about the fixative quality that a conventional use of language has to make one a prisoner of his/her own physiology (fig. 71). Considered in relation to Tzara's text, the image suggests that the concretization of the physiological bases of mentality occurs through a conventional use of language which, in its capacity as nervous rhythms and conductions, repeatedly reinforces preexistent conventional biorhythmic paths of conduction and expression.

Ernst has turned a picture of physiological therapy, in which bodily pain is soothed by soft electric currents, into an infective diffusion of language into the body from the outside. Crucial in this relationship between image and text is the notion that language was a bodily phenomenon, that it entered the body as a system of currents, which is akin to Ernst's image. Tzara's statement about conventional language as a fear that weighs down one's very bones, coupled with Ernst's macabre visualization of this premise, gives way to more hopeful ambition for language and creativity. Both gestures pursue the potentials of a critical approach to the psychophysical premise of language as a nervous emanation or oral gesture of sonorous texture—the definition explored by all interested parties in Zürich and Ascona.

The next sentence in Tzara's *Monsieur Aa* text extols the full potential of the nervous system: nerves are oceanic and vast, and can transform into feverish and torrential rails, like the trolley car lines that had spread through an entire city, connected by the same base charge. This microbiology of linguistic seepage also appears in the following lines from the same text, where a conventional use of language becomes a toxin for the body's tissues: "Words will become hostile conclusions – taking an existence which acts directly on the cell and the operation (*spéculation*) of blood."[75] Everyday language and the rhythms of everyday life were too rational and mathematical. Language was one technique of the body that had to change. Its infection of the cells and blood led to an "ineffective sonority" established as the base of a "market logic and compromise."[76] Tzara constructed the psychophysics of a literary sellout in these lines, which is why he used *spéculation* rather than *circulation* in reference to blood. *Speculation* means operation, but in terms of a market structure, not a body structure. In

his framing of the conventional speaking body, the logic of the body's movement patterns and emanatory nervous conduction paths, which generate linguistic expression, fall entirely in line with convention and meets a market demand. Meeting this demand has its own reward, but the consequence is a vacancy of expressive potency:

> Nothing can be effective. It's always a retreat. In tying words into a phrase, I arrive easily at the point. I always find a result there. The result and the phrase are created by the least animal resistance. Giving them a value is a sign of vulgarity.[77]

None of these conventional body mechanics or economy of symbols enables physiological change, and the vibrating sonority of conventional language as gesture could never alter the physiological platforms of consciousness outside of a market structure. The power of language would lie in the manipulation of its basic forms as these forms related to explicit movement qualities that would strengthen their quality of sonorous vibration based on new arrangements or maneuvers.

For Tzara, the vibratory nature of language was a *materia prima* that an artist could sculpt in a manner that encouraged mental change. Conventional usages of words "cannot guarantee their real virtue, the *jouissance* I have in forcing their manipulation."[78] Syntax will become a game of shifting textures that reduces language to shifting, elemental levels of sonority. Again, this is no bare formalism. This elemental level of increased rawness will alter the speaking body at levels far below the level of *mentalité*:

> One should kill the result before finishing the phrase and not develop it after grammatical necessities. Syntax is algebraic and (our use of it) gives us logarithms for calculations of delicacy.[79]

Tzara's focus on syntax as an arrangement of sonorous texture exemplifies his positing of poetic creation on the most elemental bodily level of felt rhythm and nervous vibration. Addressing this elemental level was the only way to trigger its mutation.

Consider the psycho-physiological consequences of these techniques in the light of Tzara's relationship to the body-altering capacity of language. Any use of language will be an expression of signification, but more importantly, it will be a transmission of nerve-altering movement. These new methods of coordinating linguistic texture unfold with the sole intent to return to base levels of expressive physiology that signal the return of consciousness to an elemental level. Language, like artmaking, is both of and from the body. New uses of it change that body and turn the nerves loose into an oceanic exponent.

It was in this context of expression, in which new forms of expression and poetics were inextricable from alterities of neural embodiment and change, that Ernst made his initial investigations of frottage, or the composition of imagery out of combined graphic registries of surfaces. Ernst's first investigations were modest, as in this small rubbing made on a piece of scratch paper (fig. 72). The method and resulting imagery quickly expanded to more complex territory with a work, also from 1921, titled *The Trinity of Anatomy* (fig. 73). This frottage work carries forth the artist's interest in using imagery that suggests the neural changes that happened in his own body while making the new movements of the work's construction—i.e., of conjoining new motions of tactile inquiry into a single space. The work likely began with appropriated images from anatomical charts illustrating the skeletal and muscular structures of the body. The artist has retained the numbered labeling of the figure's various tissues but has removed the key in which

the muscles would be listed, thus withholding taxonomic correspondences between the body and information about it.

Removing the anchor of classification then gave way to overt alterations of the body's surfaces with new forms of tactile inquiry. He covered each of the four bodies with a mixture of different rubbed textures. Having placed the sheet over different surfaces, he then filled in certain areas on each body with varying bits of texture, such as the lace and netting of various kinds that overlap and intertwine across the span of each body. This small work is easily the most complex of the modest number of frottages the artist made from 1921 to 1925, the year in which the process became a major focus. This small frottage suggests in a novel way that new forms of motion in artistic process could alter the nerves and create, in this case—a trinity of anatomies, multiple forms of being and knowing.

That Breton knew of these ideas is clear from the publicity surrounding Ernst's first exhibition in Paris (May 3-June 3, 1921) at the Au Sans Pareil bookstore. Amidst a flux of puns, the flyer advertising the exhibition boasts that the artist would appear, albeit under a whisky sea, in "five anatomies," which recalls the three anatomies in the title of the frottage previously discussed (fig. 74). That work did not appear in the Paris exhibition, but another, titled *Deshabillés*, did appear and posited the potentialities of neural alterity and multiplicity that could arise from the making of new art objects (fig. 75). This work consists of two figures clipped from an anatomy textbook that illustrates the nervous system as it courses through the body to the brain. The work and its doubling of the nervous system confirms the artist's interest in creating objects that could trigger nervous change.

Breton captured these notions in his brief essay that appeared in the modest catalog for the exhibition. His text illustrates the extent to which he had absorbed Tzara's criticism in his considerations of Ernst's works as objects that could alter the mind through the senses and nerves:

> But the marvelous ability to reach out, without leaving the field of our experience, to two distinct realities and bring them together to create a spark; to put within the grasp of our senses abstract figures with the same intensity, the same high relief as the others; and, by removing our systems of reference, to disorient us within our own memories—that is what holds Dada's attention for the time being.[80]

This notion of lyricism, or described by Breton in the above quotation, will feature later in his first Surrealist manifesto of 1924, in which he will pull all the stops from his accumulated intellectual strengths and sources. As Kim Grant has established, Breton adopted the notion of a lyrical construct—the combining of two distant realities into a new, third reality—came to Breton as a result of his friendship with Pierre Reverdy, who considered the compositional technique to be the foundation of modern poetry. In addition to Reverdy, however, the language Breton used—calling forth the senses, using intensity as a value of contact with the work, and describing the resulting mental phenomenon as a spark—drew on the critical approach to physiological psychology within Zürich Dada, which was known to both Ernst and Breton from their close friendship with Tzara.[81] Although he would have bristled at any moment in his life at the very suggestion, Breton owed a great debt to Tzara's groundbreaking theorizations of critical approach to science and psychology.

It does, however, remain to be seen how this science figured into the broader complexities of the French context, in which Breton, as a former medical student, surely encountered it. The overall complexities of Paris do not allow a further investigation in the present study. However, Breton's early reaction to Ernst's work is a clear indication that he had an interest in modifying these notions of physiological psychology within a sphere of radical artmaking.

With respect to Ernst's work, it is useful to close this chapter by establishing that his interest in the altered nervous system was an interest that he carried well into the 1930s. For example, Ernst directly addressed the notion of neural alteration through artistic process in a little known frottage called *Birth of a Nervous System* (1925), which he made around the time he was producing objects that would constitute the better known *Histoire Naturelle* series (fig. 76). In the work, nerve endings creep like ivy across a surface in the foreground that gives way to a seemingly limitless vista. Considered in relation to the frottages from 1921, the work encapsulates in its title the overall intention of the processes used to create it. The work suggests that the new forms of movement used to make the frottage could, in fact, engender a new nervous system out of unconventional systems or patterns of tactile engagement with the world of objects.

Another fascinating work is a photogram the artist constructed as one of the illustrations for Breton's essay "*Le Chateau Étoilé*," which appeared in *Minotaure* no. 8 (1936). In this work, Ernst placed large leaves over photographic paper so that the venation of the different bits of foliage overlapped to create a dazzling play between symmetry and irregularity (fig. 77). Its suggestive caption, *Unir ton systeme nerveux au mien dans la nuit profonde de la connaissance*, plays on the visual and structural

similarities of leaf venation and the nervous system that Ernst had explored in works since the early 1920s. The image confirms his ultimate goal as an artist to explore new frontiers of mentality, regardless of whether extant theories of that mentality correlated or reinforced one another. With respect to the rest of the material discussed, the relative lateness of this work and of *Birth of a Nervous System* testify to Ernst's continuing interest Ernst had in offering critical reactions to and remobilizations of the German physiological psychology he knew so well. The ways in which this interest came into play with his better documented contacts with Freudian psychoanalysis remains to be studied.

I have focused most extensively on Ernst's contacts with ideas of gesture coming from Zürich as the means to establish the critical approach to physiological psychology as a major area of interest during his formative years as a Dada artist. Additionally, it has been my hope to understand in a fuller way his artistic practice outside rote visualizations of Freudian symbolism. Ending this study prior to Ernst's arrival in Paris was necessary, because the chaos, both artistic and personal, that immediately preceded and followed his arrival in Paris falls outside the scope of this study.

Foremost among the turmoil in Ernst's life came from his friendship with Paul Eluard and his romantic involvement with Eluard's then wife, Gala. Ernst met the Eluards in November 1921. Aside from all the personal, romantic intrigue that this trio created among themselves, Ernst's friendship with Eluard eventually drew him further into Paris Surrealism and away from hopes for an internationalist Dada subcollective as represented by Tzara, which, due to all the clashing egos in Paris, had since lost its appeal. Breton was the main conductor behind this push away from Tzara's brand of

Dada and others were quick to listen, given Breton's status as the editor of *Littérature*. This journal had been a main Dada vehicle, to the extent that Tzara and Breton had hoped it would become *the* single Dada publication after Tzara arrived in Paris. But by the beginning of 1922, however, Breton was looking to expand his scope by organizing an international meeting of artists and writers that had the rather verbose title "International Congress for the Determination and Directions and Defense of the Modern Spirit."

Despite his later participation in the Weimar Congress, Tzara thought Breton's proposal contradicted the spirit of radical artmaking. He was part of a four-person tribunal—also including Eluard, the poet and critic Georges Ribemont-Dessaignes, and the composer Erik Satie—who confronted Breton at the Closérie des Lilas café on February 17 and forced him to abandon any hopes for a Congress. As Breton groped for allies, he tried to reconnect with Picabia, who jumped at the chance to attack Tzara, having recently been attacked by Tzara in the pages of *Dada Au Grand Air*. At this time, Breton had also begun to shift *Littérature* away from Tzara's brand of Dada, publishing statements against Dada as a whole and, in particular, against Tzara.

In early 1923, Ernst and Picabia submitted work to the Salon des Independants, at which the relationship between Tzara and Breton had another chance to be mended. However, too many egos were involved, and this time, a clash between Picabia on one side and Tzara and Soupault on the other. Tzara received the blame for this failed settlement of differences, and shortly thereafter received a letter signed by the Parisians, as well as by Ernst, which essentially barred Tzara from further participation in Paris Dada. That ban carried over to the early years of Surrealism, but Tzara's career after he

received excommunication has not received the attention it deserves—namely, the ways in which he operated in this supposed obscurity.

These events culminated in the shameful confrontations of physical violence surrounding Tzara's "Evening of the Bearded Heart" in July 1923. At different times during the various performances, Breton stormed the stage and broke the poet Pierre de Massot's arm, while Eluard bounded past the footlights to strike Tzara and René Crevel. Despite Ernst's closeness to the *Littérature* group and especially to Eluard, he did not participate in this protest of Tzara's event. This must have been a confusing time for him. Not only were his personal relationships rather tempestuous, but his relationship to any form of avant-garde subcollective that was akin to his experiences with Tzara and Arp must have looked impossible in the face of all the cliques in Paris.

The Parisians poeticized these years of indecisiveness by referring to it as *le mouvement flou*, which connotes an overt kind of flux and indeterminacy—i.e., a sort of drift in orientation away from any single outlook or potential creative outpost. But Dada itself also has this chaotic nature, one that pervaded Ernst's early career, but also encouraged a coming together of artists into small groups that fomented certain modes of critical practice and spaces for shared expression. Based on the findings outlined in the preceding study, this *flou* is a useful termination point for this look at the avant-garde and at Ernst, in particular.

[1] When the art historian Evan Maurer asked Ernst about his early awareness of primitivism, the artist unsurprisingly named Freud, but he also named Wundt. Given the context of the discussion, the artist was likely referring to the VP. As previously argued, that work gives one both a refresher in physiological psychology and a rigorous application of its main tenets to the history of cultural development. Evan Maurer, "In Quest of the Myth: An Investigation of the Relationships between Surrealism and Primitivism", PhD Diss., University of Pennsylvania, 1974, 191; cited by Legge, *Max Ernst*: *The Psychoanalytic Sources*, 209 n. 7. For a lengthier discussion of Ernst's time at university, see Edward Trier, "Was Max Ernst studiert hat," in Herzogenrath (ed.), *Max Ernst in Köln*, exh. cat., (Köln : Rheinland-Verlag, 1980): 63-68. According to Legge, Ernst also took an introductory course in experimental psychology, which would have included extensive reading of Wundt's *Grundzüge* as outlined in chapter one. Legge, Ibid, 209 n. 6. Legge's claim that Ernst's suspicion of Kulpe's focus on classifying higher mental function necessitated a dismissal of Wundt is problematic. Given the divergent methods of the two men, the claim does not really hold up in the way presented. My interest in returning to this material is to theorize Ernst's Dada works in a manner that resists collapsing them into narrative scenes in the way a Freudian analysis would, and to uncover the ways in which the psychological ramifications of the works as approaches to physiological psychology were more suggestive of mental change than declarative (albeit symbolically) of being caused by the affective unconscious.

[2] Max Ernst, "Vergleichung," *Blätter für Kunst und Kritik*, literary supplement to *Kölner Tageblatt* (January 7, 1917). Reprinted in Herzogenrath (ed.), *Max Ernst in Köln* (exh. cat., Kölnischer Kunstverein, Cologne, 1980), 87. Subsequent citations refer to this publication.

[3] Ibid.

[4] Ibid.

[5] Ibid.

[6] William Camfield, *Max Ernst: Dada and the Dawn of Surrealism*, exh. cat (Houston: Menil Collection and Munich: Prestel, 1993), 39-40. Camfield's book remains the central source on this period in Ernst's career, both for its readability and attention to detail. I would like to thank him again for encouragement and hospitality during my work in Houston and Paris.

[7] For more on the importance of this exhibition in the overall history of the Werkbund, see Frederic J. Schwartz, *The Werkbund*, 174-176.

[8] Save the contact with theatre, although Ernst certainly knew of these applications from his connections to the *Blaue Reiter*.

[9] Arp was in Zürich with other Dada artists and writers like Tzara, working on *Der Zeltweg*, the final Dada publication from Zürich. Arp and Ernst first met in 1914. By "last," I mean the last publication from Zürich as a geographical locale. The final publication, *Dada au Grand Air*, is discussed below and involved Ernst directly. In this rich climate of artistic, literary, and political activity, Ernst's style underwent radical metamorphoses as he fished around for new ideas in the work of his contemporaries Giorgio de Chirico, Francis Picabia, Kurt Schwitters, and Alexander Archipenko by trying out different facets of his fellow artists' techniques in exploratory drawings, paintings, collages, and *Merz*-like assemblages.

[10] Baargeld, "…knocks the warm egg out of the hand," *Bulletin D* (Fall 1919), unpaginated, repr. and trans. in Kuenzli, ed., *Dada* (London: Phaidon, 2004), 242.

[11] The original publication's title appears in lowercase. Baargeld's father funded the publication of this volume.

[12] This tension within the graphic as found is a key concept in, for example, Marcel Duchamp's *Standard Stoppages* (1914), for which he created delicate curving lines by taking meter long strings and dropping them from an elevation of one meter, after which he traced the shape of the string onto wood and cut out the shape, thus creating delicate curving lines with very little application of hand drawn artistic acumen. Ernst's work, by contrast, featured a tension between these two creative practices in conjunctions of the mechanical and handmade, as in *Don't Smile*. In this combination Ernst is more in line with Picasso's Cubist collages, which often contain combinations of collages graphic imagery on which the artist then drew or painted, or contain bits of found paper with a mass-produced visual representation that was originally hand drawn. Ernst has departed from this more classic dichotomy in using printing blocks, rather than found images, to include visual representations into his work. This technique would, of course, change quickly.

[13] It is this complexity that separates Ernst's process entirely from artists whose work appears to resemble his, such as that of de Chirico, who never approached artistic media with such a clear interest in complexities of this kind.

[14] My analysis of this piece is based on condition reports made in connection with the Menil exhibition, "Max Ernst: Dada and the Dawn of Surrealism," undertaken by William Camfield and the conservation staff at the Menil Collection, Houston, during the summer of 1993. With Dr.

Camfield's encouragement, I have also drawn on unpublished lecture notes outlining these condition reports that he gave to the Menil Collection, coupled with personal conversations with Dr. Camfield that occurred throughout the writing of this dissertation. Full credit is due to him and the conservators at the Menil for locating these discrepancies of process in *Don't Smile*, to which I have appended an interpretation based on Ernst's contact with Schwitters. I would like to thank Geri Aramanda, archivist at the Menil Collection, for her assistance with the Camfield papers.

[15] For a list of the print sources see Spies, *Max Ernst Collages*, 486.

[16] The notion that these works sculpt a *psychically* pathological subject position is not incorrect, but it is partial, and dependent on a very conventional notion of the artist as a social critic who calls attention to the ills of modern society that others have tried to repress. It is a narrow sense of criticality and of what an artist does or should do. Social commentary does not have to depend on a reflective address from the individual psyche framed as a pathological entity.

[17] But the problem with these interpretations is that all of them require a certain iconography of symbolic gesture or staging of the visual representation that undercuts a sense that the creative drive of the work could be unconscious. Ernst made work during this period that addressed this category of gesture. For example, Elizabeth Legge has shown how Ernst borrowed poses and gestures from Emil Kraepelin's various texts on dementia praecox and hysteria. But the collages of body parts differ considerably from representations of figures making gestures. Epistemological knots like this one have plagued methods of art history that rely on psychoanalysis, because historians cannot or will not arbitrate between the different modes of creative orientation that result from Ernst's clear skill at symbol arranging and inquiries into what, if anything, could constitute a true work of art that sprang from unconscious drives—a notion that eventually came to a head in the early debates within Surrealist painting. See for example, Kim Grant, *Surrealism and the Visual Arts: Theory and Reception* (Cambridge: Cambridge University Press, 2005). Given this warrens of problems, coupled with the separate psychological discourse under study here, it is not the place to undertake a concerted study of the problems that arise in studies of Ernst's work that lean too heavily on psychoanalysis.

[18] Wundt, *Principles of Physiological Psychology*, Titchener trans., 153.

[19] Ibid.

[20] Ibid, 154. The subjects of these tests were most often chimps, horses, or dogs.

[21] But, again, degeneration was not a hidebound type. The geneticist or racialist discourse of degeneracy that found its way into discourses on art through the work of, among others, Max

Nordau, is antithetical to the Wundtian notion of degeneracy, which simply means an assault on tissues that had psychological consequences. See Nordau, *Degeneration* (London, Hennemann, 1895).

[22] The direction this transformation corresponded with the nature of the conduction path, so motor degeneration was centrifugal and sensory degeneration moved centripetally. These two levels of inquiry were essential, but Wundt cautioned that sole reliance on only these two methods would not lead toward structured results. Consequently, this method is at best an aid for other types of experiments that foster understanding of the relations between definite areas of the cortex and peripheral sensory organs. One may also focus on paths of conduction in the central organs of the brain (Ibid). These mapping exercises would give a researcher a sense of how the subject functioned in space with varying degrees of success or atunement. Wundt's caveat about sole reliance on physiology should be remembered here, however. He never believed that mere testing could uncover the true inner workings of psychology as *Geisteswissenschaft.* One could only flesh this puzzle out in the deepest terms by means of comparative ethnohistory.

[23] For more on the interest Ernst had in Mary Wollstonecraft-Shelley's *Frankenstein*, see Spies, *Max Ernst: A Retrospective*, exh. cat., (New York: Metropolitan Museum of Art, 2005), 97. This text was written at a time when human thought and mental function was first being framed in terms of physics, thermodynamics, and other mechanical structures of energy, as in the writings of Fechner and Herbart. It is perhaps why Shelley made her ill-fated protagonist German rather than British.

[24] Umland et al, *Dada in the Collection of the Museum of Modern Art*, 142-147.

[25] The coccyx is the final bone segment of the spinal column.

[26] These planes are imaginary axes through the body that determine the nature of what is shown in a cross section. The coronal median divides the body into front and back, while the sagittal divides it right and left, being a vertical plane through the longitudinal axis of the trunk. The author would like to thank his mother, Mary Mowris, R.N., for explaining this difference on several separate occasions.

[27] The forearm has two main bones; the radius is the bone on the thumb side of the wrist.

[28] I would like to thank the staff of the Department of Prints and Drawings at the Museum of Modern Art, New York, who graciously fitted me into their busy schedule in order for me to study the work, which luckily happened to be unframed at the time.

[29] Given the phallic nature of the forms in the work, in addition to the references to sperm or seed, scholars have analyzed this work in Freudian terms as a critique of bourgeois, masculinist display

and repression, despite the fact that the majority of hats in the image are not the categorical bourgeois top hatsThe majority of the hats are tri-corner and bucket hats, which would be the accessory of a peasant, not an urban bourgeois. The basic reading of this work focuses on the man as seedless and seed-covered, which implies that the figure has masturbated. The most successful and best outlined argument of this theme in Ernst's Dada period is by Hal Foster, "A Bashed Ego: Max Ernst in Cologne," in Dickerman and Witkovsky, eds., *The Dada Seminars* (Washington, DC: National Gallery of Art and New York: Distributed Art Publishers, 2005), 127-150.

[30] either as an entire venation system, or as individual dendriform endings on the cells (the splayed endings of neurons are still referred to as dendrites).

[31] Tzara, "Note on Art: H. Arp," *Dada* no. 2 (December 1917), unpaginated, repr. in Tzara, *O.C.* vol. 1, 396.

[32] In German culture, these visual similarities of physiological structure had supported major pillars of *Geisteswissenschaft*. It is likely that this punning construction of internalist anthropomorphism is also a tongue in cheek reference to the early physiologist Gustav Fechner's argument that plant forms had a psychic life, based on morphological similarities in nature that suggested the existence of a sort of cosmic consciousness existed from which all life forms drew. For analysis of these issues in Ernst's later work see Elizabeth Legge's fascinating essay, "Zeuxis's grapes, Novalis's fossils, Freud's flowers: Max Ernst's natural history," *Art History* 16 (March 1993): 147-172.

[33] Wundt, Principles of Physiological Psychology, Titchener trans., 29.

[34] Ibid, 29.

[35] Ibid, 30.

[36] Ibid, 29.

[37] Ibid, 31.

[38] Ibid.

[39] For the human race, these differences were also cultural and became the focus of the *Völkerpsychologie*.

[40] Wundt, Principles of Physiological Psychology, Titchener trans, 38.

[41] This contractility had been a major reference point for Fechner's earlier argument that plants gained psychic life from the cosmic consciousness in which all life forms participated.

[42] Wundt, Ibid, 30.

[43] Ibid

[44] Wundt, Ibid, 35.

[45] This disorder is also known as dropsy.

[46] For more on the disease and its appearance in Ernst's time, see Couch and Galdorisi, *The U.S. Armed Forces: Nuclear, Biological, and Chemical Survival Manual* (New York: Basic Books, 2003), 155-157; Charles Edward Stuart, *Weapons of Mass Casualties: A Terrorism Handbook* (Boston and Toronto: Jones and Bartlett, 2005), 98-99; Gregory R. Cittione, ed., *Disaster Medicine* (Amsterdam and London: Mosby, 2006), 647-649; Sharad S. Chauhan, *Biological Weapons* (New Dehli: APH Publishing, 2004), 369-370.

[47] Wundt, Principles of Physiological Psychology, Titchener trans, 33. One should remember that these machinations of tissues occurred at the level of species rather than culture; the latter category was the focus of the VP.

[48] Camfield, Ibid, 158

[49] Tzara, in Wright, trans., *Seven Dada Manifestoes and Lampisteries,* 11.

[50] Ernst, "*Rechtzeitig erkannte angriffsplane der assimilanzfaden auf die feste dada*," handwritten mss., Fonds Tzara, Bibliothèque littéraire Jacques Doucet, Paris, TZR.C. 1465.

[51] All of these exercises undercut completely the anthropomorphic scale of the Freudian body. The presentation of sex as mechanized and dehumanized is not associable only to Ernst, but clearly drew on the artist's awareness of Duchamp and Picabia as well. See Henderson, *Duchamp in Context*.

[52] Translation of this work and the poem may be found in *The Dada Reader: A Critical Anthology*, ed. Dawn Ades (Chicago: University of Chicago Press, 2006), 205-206.

[53] Ernst, "Der Arp," *Kölner Tageblatt*, December 6, 1921, repr. in Herzenograth, ed., Max Ernst in Koln, 85.

[54] For a reprinted and translated letter from Ernst to Tzara explaining the abbreviation, see Spies, *Max Ernst: Collages*, 271.

[55] Arp may have been there more than these two times, for his father lived in Cologne. These visits helped inspire Ernst and his fellow Cologne Dadaist Johannes Baargeld to work more intensely on Dada activities, which culminated that April with the release of *die schammade,* a publication of Dada art and poetry. In the early Fall, Ernst began to use collaged imagery from teaching aids catalogs. From October to November of 1920, Ernst and Arp worked intermittently on visual and textual assemblages created under the shared moniker *FaTaGaGa*. Ernst's work with Arp on the *FaTaGaGa* collages never resulted in a finished production, although the once existent 150-page folio of carefully organized images and inscriptions once held by Tristan Tzara clearly indicate the possibility of such a final goal. This folio was subsequently dismantled and

collages were removed from their context and sold as individual works after the writer's death, a destruction of the archive that rivals the sale of Breton's library and personal papers. It is tantalizing to see indications in the archival materials that Tzara had created a kind of correspondence code between the texts and images by using numbers and noting where certain works would appear, or how large the reproduction should be.

[56] In a brief autobiographical text that appeared in *Das Junge Rheinland* in November 1921, Ernst wrote that the *FaTaGaGa* pieces may be seen as "mute," or can be shown without captions. Camfield, Ibid, 338, n. 54.

[57] Ernst, "Der Arp," Ibid.

[58] Spies, *Max Ernst Collages*, 65.

[59] Arp, "physiomythologische diluvialbild," c. 1920, hand written ms. in Fonds Tzara, Bibliotheque litteraire Jacques Doucet, Paris (TZR.C. 1462); repr. and trans. in Spies, Ibid, 66. The visual appearance of this text does not suggest written verse, and I have therefore omitted verse breaks that would suggest as much.

[60] Ernst, "Job Haubrich," undated mss., fonds Tzara, BLJD, Paris. Spies dates this text to the same general period as the FaTaGaGa. Spies, *Max Ernst Collages*, 66.

[61] For a general introduction to Lavoisier's experiments, see Henry Guerlac, *Antoine-Laurent Lavoisier: Chemist and Revolutionary* (New York: Charles Scribner's Sons, 1973), 68-75; Madison Smartt Bell, *Lavoisier in the Year One* (New York and London: Norton, 2005), 56-60; Arthur Donovan, *Antoine Lavoisier: Science, Administration, and Revolution* (Oxford and Cambridge: Blackwell, 1993), 134-155. Bowler and Morus, *Making Modern Science*, 67-71.

[62] Spies, *Max Ernst Collages*, fig. 623.

[63] Francis Picabia, *Poèsie ron ron* (1919), repr. and trans. in *I am a Beautiful Monster*, trans. Mark Lowenthal (New York and Cambridge: MIT Press, 2008), 132.

[64] As for those famous gasometers, the instruments entered the collection of the *Conservatoire Nationale des Arts et Métiers* in 1866. Maurice Daumas, "Les Appareils d'experimentation de Lavoisier," Chymia no. 3 (1950): 45-62. As Linda Dalrymple Henderson has established, this institution was a major source of interest among the avant-garde, especially for Picabia and Marcel Duchamp (Henderson, *Duchamp in Context*, 17-18). Picture postcards show that by around 1900, the two instruments were part of a re-creation of Lavoisier's laboratory in the museum, which one can still see today. This installation served as the model for the replica of an eighteenth-century chemist's lab, known as the "Lavoisier room," in the Deutsches Museum of Science and Technology at Munich, which opened in 1906 and by 1913 boasted 300,000 visitors

a year (Otto Mayr et al, The Deutsches Museum (London: Scala Books, 1990), 9-12). Ernst visited Munich in September 1919, and given the fanfare associated to the museum, may have taken a day to wander through it. This trip would certainly help explain the upsurge in technological imagery in his work from that period.

[65] Tzara, in Wright, Ibid, 43.

[66] Repr. and trans. in Spies, *Max Ernst Collages*, 66.

[67] Repr. and trans. in Spies, Ibid.

[68] This activity is, of course, connected to the widespread notion that the human body was an analogue of the machine and the connected notion of the automaton, which, of course, is also a feature of the CNAM's collection. For various studies of this notion, see Henderson, *Duchamp in Context*; David Channell, *The Vital Machine: A Study of Technology and Organic Life* (Oxford: Oxford University Press, 1991); Jonathan Crary and Sanford Kwinter, eds., *Incorporations*, Zone 6 (Cambridge: MIT Press, 1992); Crary, *Techniques of the Observer*.

[69] Tzara, *Coeur à gaz* (1921) repr. and trans. in *Modern French Theatre*, trans and ed. Michael Benedikt and George E. Wellwarth, (New York: Dutton, 1964), 135.

[70] On September 18, Breton soon arrived in Tarrenz while on his honeymoon with his wife, Simone, but could only spend a few days with Ernst and Tzara, because the latter's visa was soon to expire. On October 3, Paul Eluard and his wife Gala arrived in Tarrenz, where the four intrepid travelers went to Vienna and met Freud, an encounter that proved particularly disappointing to Breton, given the comfortable bourgeois existence of the psychoanalyst, and the conventional niceties with which he received the young writers.

[71] Ernst's ill-fated ballet is one of those tantalizing avant-garde projects that never occurred. One only finds traces. For example, in a letter to Tzara dated October 8, 1921: "I am impatiently awaiting the decision of whether anything is going to come of our ballet, and with it of my trip to Paris this winter." (Ernst, letter to Tristan Tzara dated October 8, 1921, repr and trans. in Spies, *Max Enst Collages*, 271). Word of Ernst's project reached Breton in this letter from Tzara dated December 27, 1921: "Ernst is experiencing difficulties in coming to Paris, but he will certainly come. He has devised a pantomime in a very new spirit; it will be striking if it can be staged successfully." Tzara, letter to Breton dated December 27, 1921, repr. and trans. in Michel Sanouillet, *Dada in Paris*, trans. Sharmila Ganguly (Cambridge and London: MIT Press, 2009), 365. To my knowledge, all record of this project has been lost, save for these brief mentions in correspondence between the artists involved.

[72] Tristan Tzara, Max Ernst, Hans Arp , Maya Chrusecz, Luise Straus-Ernst (as Armanda Duldgedalzen), Sophie Taeuber-Arp (possibly as Rosa Bonheur), "Brieflicher Alpengruss riebst Bonnen – vergifting durch Jadeln," c. August 1921, Fonds Tzara, TZR.C. 1459, Bibliotheque litteraire Jacques Doucet, Paris.

[73] "*La lâcheté connait son ordre, c'est le poids de la peur que nous portons tous dans les noyaux des os. Les nerfs de l'ocean sont les rails du vent et de la chaleur*." Tzara, "*Monsieur Aa antiphilosophe*," *Dada Augrandair*, (September 1921), unpaginated. To my knowledge this portion of Tzara's various Monsieur AA writings does not appear in Behar, ed., Tzara, *Oeuvres completes*, vol. 1.

[74] Ibid.

[75] Ibid.

[76] Ibid.

[77] Ibid.

[78] Ibid.

[79] Ibid.

[80] Breton, "Max Ernst," repr. and trans. in Breton, *The Lost Steps*, trans. Mark Pollizzotti (Lincoln: University of Nebraska Press, 1996), 60-61. Gavin Parkinson has offered a fascinating alternative reading of these lines in his study of Surrealism and modern physics. Parkinson, *Surrealism, Art, and Modern Science*, 55-56.

[81] Kim Grant, *Surrealism and the Visual Arts: Theory and Reception* (Cambridge: Cambridge University Press, 2005), 32-36.

Conclusion

Following his final break with Dada in May 1917, Hugo Ball began writing that fall a lengthy treatise that fall, the explosive and very problematic *Critique of the German Intelligentsia*, which was published in January of 1919. The text's rather shocking anti-Semitism is largely the reason for its notoriety today. His view of the Jews was part of a broader suspicion of any religion or state structure that, in his opinion, threatened the formation of what he defined as a more wholesome variety of Catholic community. Ball had been inspired to pursue such a vision after reading medieval Catholic scholars who worked in Germany before the Protestant Reformation.

Intellectuals in Ball's own time, such as Ernst Bloch and Hermann Bahr, and figures from the present, like Anson Rabinbach, have criticized the overarching racism and epistemological blind spots in Ball's *Critique*.[1] Scholars struggling to tackle the nature of Ball's racism have dominated studies of this text, a factor that has led to a general neglect of other intellectual ventures Ball sets forth in its pages. Aside from more dominant criticisms of Ball's text, one small bit of diatribe against the Lutheran backgrounds of many major German intellectuals is a telling glimpse of the way in which the intellectual landscape has altered in the time since Ball wrote his text: "Rarely since the Reformation has a significant figure emerged in Germany who did not count a clergyman in his ancestry. Lessing and Schelling, Fechner and Wundt, Mommsen and Lamprecht, Harnach and Nietzsche are all sons of pastors."[2] That these men were the sons of Lutheran pastors contributed, in his opinion, to their establishment of a broader cultural outlook that Ball described as "rational-minded" and obsessed with "mastery of physical being."[3] Like so many other artists of his day, Ball took issue with the ideological ramifications of science as a cultural force—both for what it said and for what its doctrine implied about the potentialities of the mind or the limitations on it.

Wundt's name is simply tossed off in a list of German intellectual giants, and unlike other figures from German intellectual history like Martin Luther, Fichte, or Goethe, he did not receive any extensive analysis by Ball. Yet in its own way, this bare reference is very suggestive of the text's historical moment. In dropping this name, the ex-Dadaist assumed a great deal about his reader of 1919. That Wundt can simply be

mentioned in this manner is testament to his visibility at the time and contains the tacit assumption that a reader of 1919 would, he trusted, not only know of the psychologist, but also possess a sufficient understanding of his ideas to allow for comprehension of the different ways in which his extensive theoretical systems encouraged mastery "of what is met with and what is at hand, of immediate and sentient existence!"[4] Essentially, Ball trusted that his reader knew enough of Wundt's ideas so that he or she could reflect on them critically in reference to the author's condemnation of the Lutheran faith as being, like Wundt's science, a kind of poison. In Ball's view, such systems were preventing the potential spiritual growth of a community in the immediate aftermath of a war that had all but overpowered sentient existence with mechanized warfare and had turned Europe into an abattoir.

Ball's broad swipe at German intellectual culture invites a dialogical reading or reflection on the ways in which Wundt's intellectual system contributed to Ball's view of Germany's ontological and ideological flaws. In a broader sense, it encourages the historian to consider what a radical artist would have thought of the social place of physiological psychology during the first two decades of the twentieth century. Ball likely selected Wundt for the ontological implications of the psychologist's system and for what it had allowed in other intellectual disciplines. Wundt was also the last physiological psychologist who could guarantee universal acceptance in his lifetime as the discipline's figurehead. After Wundt, the field of physiological psychology became more diffuse, with competing theories of higher mental function that, nonetheless, were anchored to varying degrees in his earlier studies of elementary neural function. In testing varying modes of reaction time and thresholds of the senses, Wundt focused on the simplest possible neural phenomena that he understood as being connected to a person's ultimate mental function. His career gave physiological psychology its first laboratory and extensive system of experimental practices and tests, which constituted the dominant epistemological reference point for all psychology well into the twentieth century.

Wundt's attempt to restrict the scope of experiment to these simplest of nerve functions came from his belief that experimentation could not illuminate higher modes of thought, which were inherently social and based on interactions between people in a group, an idea that provided the basis of his massive project known as the

Völkerpsychologie. Wundt's students generally avoided the *Völkerpsychologie* as the method which would provide a new understanding of higher mental functions as being particular to certain societies, places, and times.[5] German physiological psychology after Wundt expanded (recklessly, in his opinion) the scope of experiment to include psychic testing, as opposed to nervous testing, and in focusing on developing laws which guided formation of a functional hardware for a rational consciousness, provided European and American scientists with an understanding that the machinations of the psyche were conformable to an outside structure of data sets, rather than a socially contrived series of conventions that varied with space and time. This split between laboratory and cultural studies shattered the stability of the field Wundt had worked to maintain, but that break made his reach entirely more pervasive in the intellectual culture of the fin-de-siècle and the twentieth century. Locating the reach of his *Völkerpsychologie* in fields like ethnology, sociology, and anthropology indicates that at an institutional level, Wundt's vast theoretical and scientific contributions were already open for a selective consumption by many different figures, who often departed entirely from the psychologist's ambitions and beliefs. Whether it was for theories of empathy in architecture or the basing of ornamental compositional techniques on alternative spatio-cognitive neural formats, as one sees in the work of Riegl, Durkheim, Boas, Lipps, or Worringer, Wundt's use of the nervous system as the basis of cultural development was deeply ingrained within mainstream German aesthetics by the close of the nineteenth century.

My brief attention to Kandinsky and Ball's friendship in the context of Munich theatre suggested that Ball's awareness of psychology, like Kandinsky's, already contained a high degree of modification exercised by figures who served competing interests in their various attempts to reconfigure innervatory structures in the interests of heightening expressive acumen or triggering social reform. The sheer availability of this science for adoption and modification clearly motivated a large number of applications of physiological psychology to the ends of improving or changing society with new forms of body-based restructuring. The clearest indication of Dada's radicality came from the ways in which the artists continuously made chance, spontaneity, and improvisation, in the sense these phenomena had as embodied experiences, into the essence of many works

of art throughout a range of different media, from performance to collage. These practices essentially undercut the upward structuring of new selves that constituted the overall theme of any outlook in *Lebensreform*.

Wundt's idea that culture manifested a mode of social psychology that was based on shared patterns of motion among people in a space lends a great deal of weight to the critical force of Dada's approach, because figures in *Lebensreform* read Wundt's description of cultural formation as the basic framework for projects of cultural renewal or reformation. The *Völkerpsychologie* went from being a method of study into a system of formation and reformation that a group could undertake for itself. The theory could be adopted as the overall grounding philosophy of social reform that based its operations on the reorganization of collective ambulation in space. This drastic and prevalent shift in reception differed immediately from applications of Wundt's theories by historians like Riegl or Wölfflin. Proponents of *Lebensreform* took the mechanics of social (re)formation as a structure to be applied, rather than studied from the outside. The former likely encouraged the latter, because the assumed readability of cultural production as modes of shared neural transmission and psychic energy contained within it a potential for a reflexive application, since the theory was based on common human neurophysiology. Anyone who applied ideas of the *Völkerpsychologie* to their own social group possessed this crucial hermeneutic insight, which constituted the most dominant manner of reading Wundt's work against the grain in the early twentieth century.

But beyond a certain manner of reading and using physiological psychology, Steiner, Laban, and Dalcroze each sought to compose a unique relationship between the energized matter of the body and the social formation of the mind. The developmental trajectory of culture, moving from bodies to minds and then to cultural expression, became a vehicle of change with machinery that was open to manipulation and diversion. Essentially, it came down to what kinds of access or possible modifications were available in certain domains of cultural practice, and the motivations each figure had for his or her system. Consequently, interpretations of Dalcroze eurhythmics as a programmatic mode of social control, in which rhythmic motion bolstered Taylorist ambitions for improving production, cannot simply be placed wholesale over other applications of eurhythmics. Too much of it happened in communes.

For example, Laban's projects in Ascona were searches for potential modifications to the relationship between bodily motion and psycho-social formation that Wundt made the generative process of all cultural development. The psychologist's interconnection of bodily habits to cultural and social practices—processes like dance, rhythm, language, and poetry—gave the choreographer a point of departure, for these associations were inherently mutable. Mutability was the office of the very bodies thought to compose a singular trajectory for a particular culture and its practices. In Laban's mind, the body could trigger both immediate and gradual social change. The *Freitanz* was the most immediate way in which this change could begin. In the *Freitanz,* the full potentials of neural change unfolded as energized bodies interacted spontaneously with one another. Reshaping the mind with the unconventional motions of the moving and reacting body laid the groundwork for a shaping of the body and mind that culminated in the purpose play.

In this activity, Laban's goals overlapped with the ambitions of Steiner to communicate higher truths of existence with new forms of collective bodily motion, but despite the choreographer's contacts with anthroposophy and other occult doctrines, his overall project of cultural reformation cannot fit neatly within any single motivating perspective. Steiner's overall project displays a different sort of complexity, in that his use of physiological psychology expands historical comprehension of his approach to the occult. Wundt's descriptions of how bodily changes affect the mind fed Steiner's suspicion of material stasis in both mind and matter, and in utilizing rhythmic group movement, he adopted and modified the supposed positivism of Wundt as one means to expand consciousness and reach transcendent realities. This science that essentially established the nature of immediate experience and reality became a system that Steiner and his adherents modified into part of a programmatic exploration of higher realities.

In light of this psychology, the group dimension of *Lebensreform* expressed the felt need to take Wundt's ideas of social formation and modify the projected results in a manner that altered or improved upon the social customs of the group's immediate surroundings. The movement possessed an overtly materialist sense of mind/body connections as the foundation of more decidedly occultist or idealist pronouncements. In both Steiner and Laban's cases, the metaphysical domain of that balance is far better

known in retrospect and is an effect of separating the occult from science that would be alien to these people. Physiological psychology was the gateway through which figures like these two began their search for higher forms of consciousness and new forms of expressive gesture that could communicate higher truths. Steiner's work offers the clearest gateway to understanding the perceived limitations of physiological psychology and, at the same time, the potential this system had for a critical reader who sought unconventional uses of it.

These uses in *Lebensreform* were all pursuits of an alternative *Bildung*, or the gradual and teleological formation of the mind through the motions of the body. The physical cultures of these reformist movements were unavoidably developmental. In that progressive approach to social formation, each figure in *Lebensreform* was attempting to create a new kind of *Völkerpsychologie* out of new takes on the systemic means Wundt had outlined in his cultural studies. It was these overall theoretical orientations toward society and culture as either method (an entity to study) or application (an entity to reform) that Ball described as being motivated by a need for "mastery of physical being," or the control of "immediate and sentient existence." The notion that cultural forms—whether of language, visual art, or music—provided the culmination of social formation had begun to look increasingly distasteful during the war. By 1919, the place of culture as a teleological culmination of a harmonious society, was no longer a value that could withstand the butchery of modern geopolitics. The only place such a notion could survive was the museum.

A more spontaneous mode of creation placed a shared experience of embodied change as the essence of artistic production, rather than making art into one more culmination of a pre-existent set of socio-cultural values. This shift allowed the group to live up to Ball's demand to "discard the Ego like a coat full of holes," and to simultaneously forge a new kind of group politic that was guided not by doctrine but by its own self-imposed dynamism of shared and spontaneous creation. As embodied experiences, these spontaneous endeavors—Ball's performances, for example—did not necessarily require the creation of a finished art object, but certainly could, as in Taeuber and Arp's collaborative collages. In light of this analysis, however, the nature of visual quality in an object has a certain place that is anywhere but at the top of a hierarchy of

aesthetic qualities. Concepts that informed the nature of motion in artistic process that occurred alongside the retroactively dominant nature of visual quality in these collages does not do away entirely with the visual sense of the object, but instead connects its partial mental energies to other potencies of sense that have long since vanished: the motions of sharing with another the moving of paper squares across a surface and the joy of working together in the creation of new aesthetic and mental harmonies.

This science and approaches to it by cultural figures can shift understanding of definitions of abstraction or "non-objective" painting that arose during this moment, for rather than being somehow non-observational, a new variant on sensory experience—one connected to higher realities—was not only possible, but reachable and shapeable in and through culture. Possibilities that new sensations, especially the most basic types, could reenergize the base levels of experience and consciousness provided a broad field of strategy out of which artists selectively utilized basic forms and laws of change to their own ends. The idea that a structured relearning of sense experience could trigger neurophysiological and psychic change in both artist and viewer clearly deserves a more extensive study.

The scope of pre-Dada uses made Dada's approach to this science appear in a manner that makes this supposedly divisive group appear more deeply knit to its context as a concerted reaction to the embodied dimensions of expression and social reform that had contributed to the upsurge of nationalism in the lead-up to WWI. Not only the science, but the general response to it by cultural figures had a generally conservative political dimension, as at Hellerau, or an idealist mode of occultism like that of Steiner, which, after the war began, took on a more idealist tinge. Zurich Dadaists' careful borrowing of Labanic pedagogy from free dance exercises exemplifies the manner in which Ball's political awakening made for a more meticulous and multi-layered absorption of intellectual sources that shied away from both total idealism and utter loyalty to a single system of expression or ontology. Dadaists did not necessarily reject anything wholesale in *Lebensreform,* except for its nationalism. Far more often, they adopted and utilized particular dimensions to their own ends, such as the neurophysiological alteration promised by improvisation or spontaneity, or the idea that language was a collectively contrived series of articulatory gestures. The nature of use in

the case of Dada gave its diverse practices a force and expressive strength. That potency comes from knowing that Dada did not get there first; they skimmed from a movement of social reform based on particular responses to modes of scientific inquiry that is little known in the world of art history today.

Initially it strikes the historian as odd that Ernst, an artist so fascinated in the creation of visual art would be interested in critically engaging physiological psychology, since any reshaping of this discipline in *Lebensreform* or Zurich Dada tended to display a focus on alterations of bodily motion through chance, spontaneity, or a concerted rebuilding of the body's practice patterns following a dissolution of prior restrictions in conventional *Kraft*. In Zurich, it was less frequent that an approach to physiological psychology necessitated creation of a concrete object, and when these occurred, it was generally in a style of geometric design. By contrast, Ernst created a macabre dimension of visual representation within a context of critical approach to a science that seemed to fall outside the boundaries of visual representation. In this attention to the visual, Ernst was still, in fact, engaging the science in question, for physiological psychology relied on an authority of images. The *Grundzüge*'s hundreds of illustrations of human tissue connoted a dimension of usefulness in educating a person about the ways in which a mind should function. Projected from this functional imperative was a sense of what a rational or "normal" mind looked like and how it formed. Ernst saw an opportunity to create humorous and often unsettling alternatives. The difference between Ernst's approach to visual representation and Zurich Dada's use of performance is a testimony to the diversity that a critical modification of physiological psychology could offer artists in the early twentieth century.

The nature of this modification was already extent in the context of European culture, which is a presence that causes the nature of Dada to emerge in a far clearer focus as closely knit to the intellectual culture of its moment. Only Dada used its culture in a manner that undermined its most dominant values. In the case of Dada, we have only begun to understand this use-oriented dimension of their art.

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[1] Outlined in Rabinbach, "Introduction," Ball, *Critique of the German Intelligentsia* (1919), trans. Brian L. Harris, (New York: Columbia University Press, 1993), xxiv-xxviii.

[2] Ball, *Critique of German Intelligentsia*, 60.

[3] Ibid, 62

[4] Ibid, 66.

[5] It is telling that none of these men stayed on at Leipzig, which was normally an admirable thing to do in the context of laboratory practice and pedagogy. Generally, a young psychologist could teach and conduct tests and research of his own, provided that the research coincided with the interests and values of the most senior psychologist.

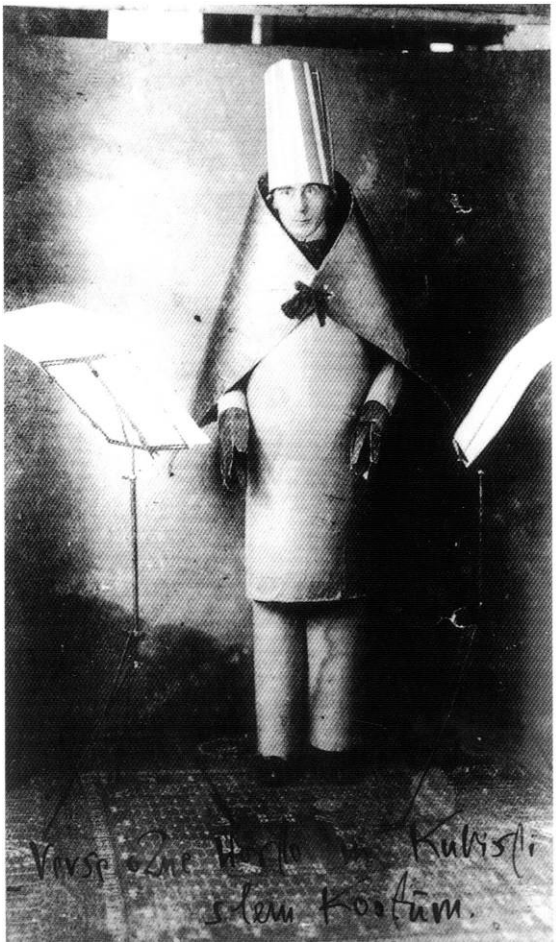


Figure 1. Hugo Ball in costume reciting his sound poems, June 23, 1916. Collection Kunsthaus, Zürich.

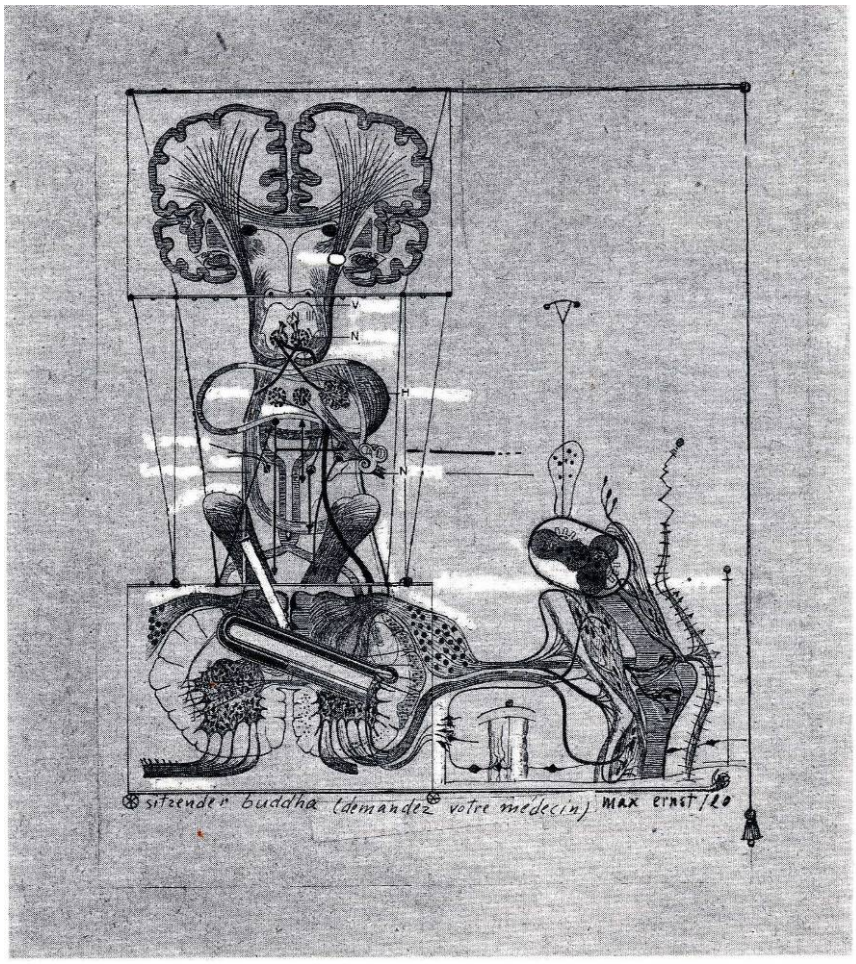


Fig. 2. Max Ernst, *Sitzender Buddha*, 1920. Gouache and ink on printed reproduction, 8 1/8 x 7 7/8 in. Robinson Collection. After Camfield, fig. 85.

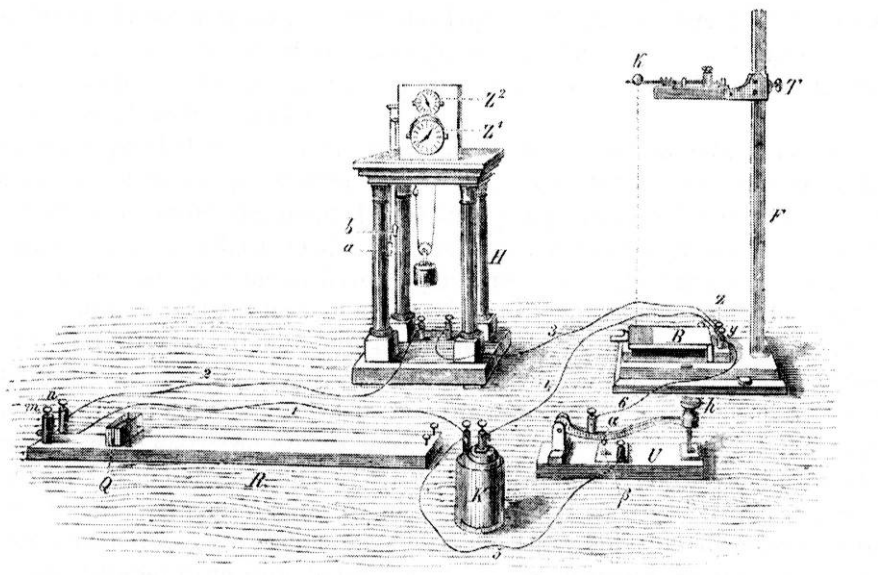


Fig. 3. Drawing of instruments utilized in reaction time experiments, featuring a Hipp chronoscope (center), as published in the first edition of Wundt's *Grundzüge der physiologischen Psychologie*, (1874, p. 770). After Schmidgen, 2005, p. 64.

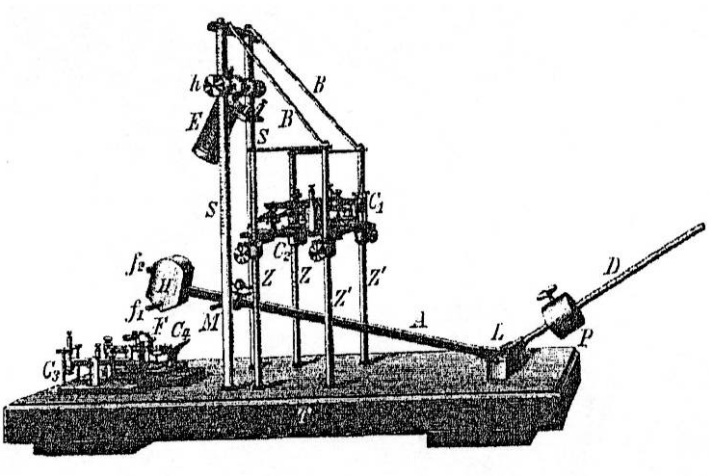


Fig. 4. Control hammer as illustrated in the fourth edition of Wundt's *Grundzüge der physiologischen Psychologie* (1893), pt. 2, p. 331. After Benschop and Draaisma, 2000, p. 8.

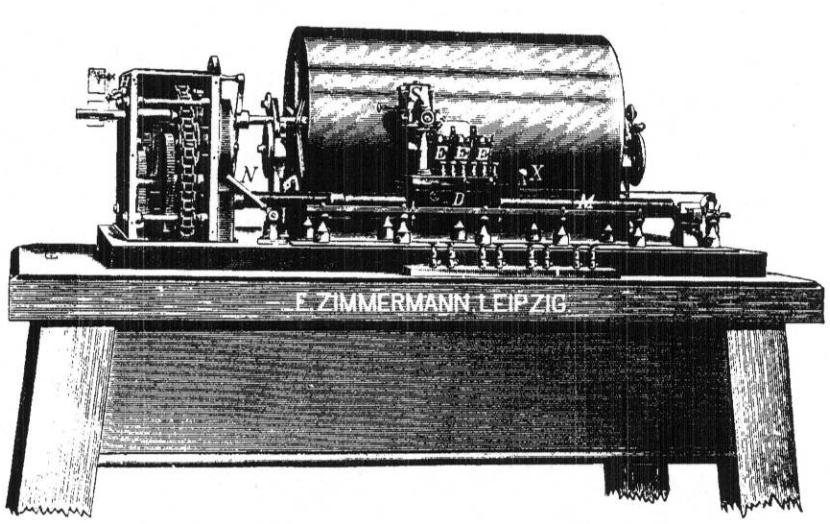


Fig. 5. Illustration of the chronograph used in Wundt's laboratory. Illustration from Zimmermann, *Preisliste über psychologischen und physiologischen Apparate*, XVIII (Leipzig, 1903), 66; after Benschop and Draaisma, 2000, 9.

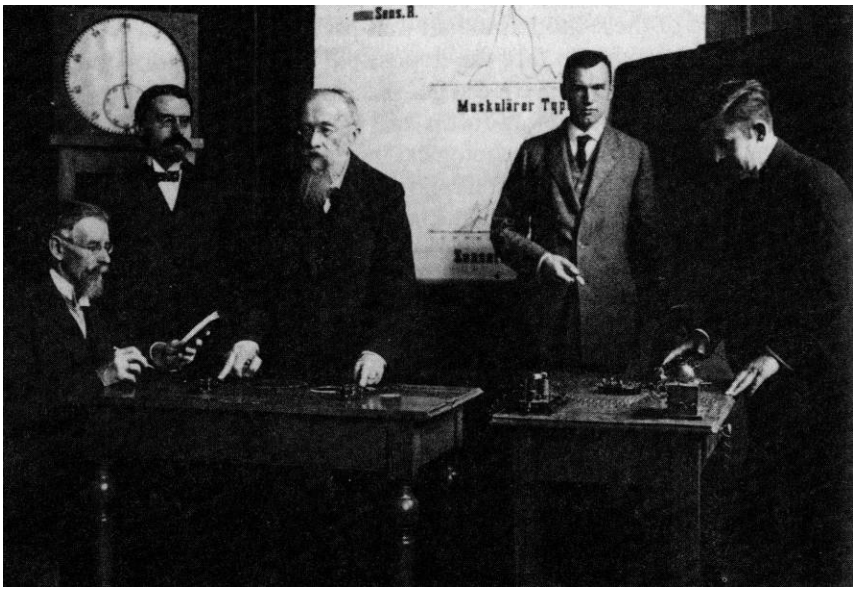


Fig. 6. Staged photograph of collaborative testing method, featuring Wundt (third from left) as test subject of reaction time experiment, c. 1910. After Danziger, 1990, p. 60.

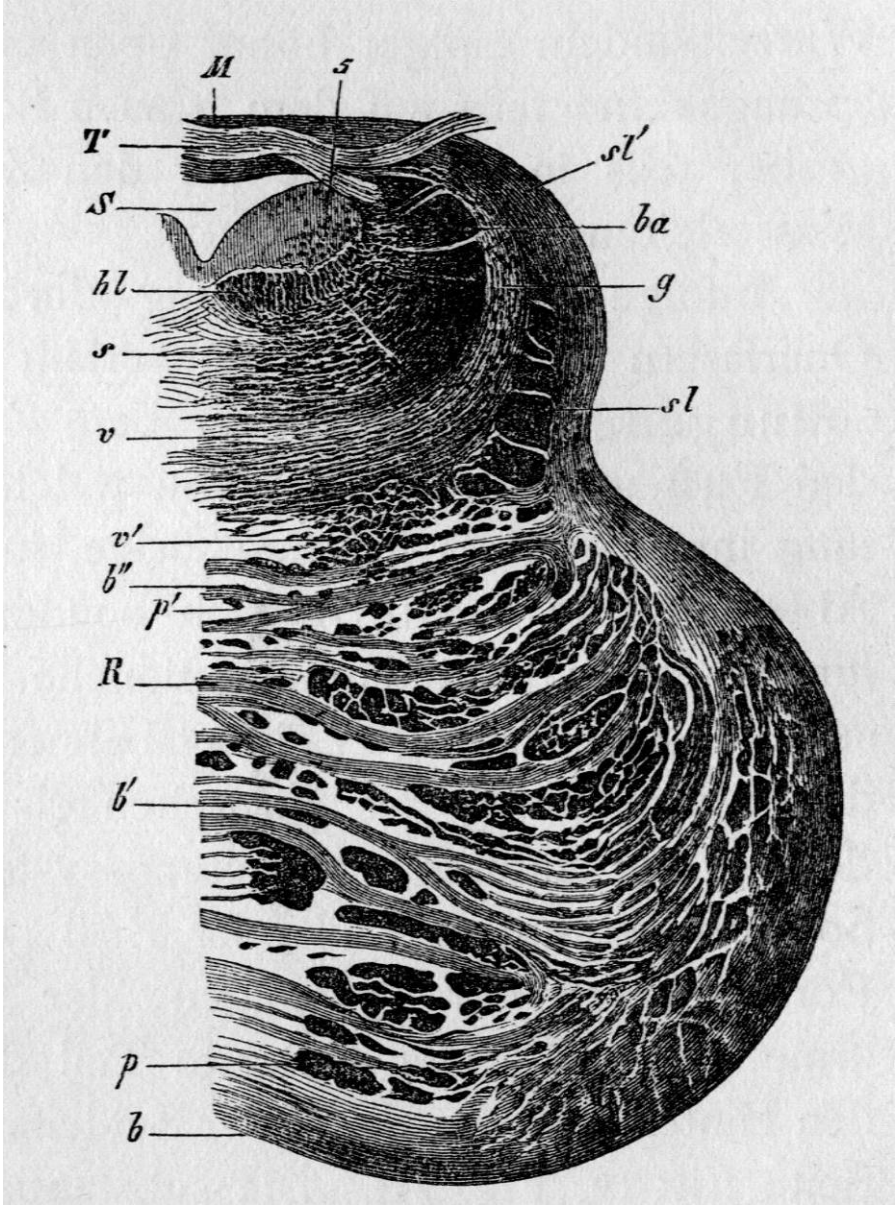


Fig. 7. Diagram of pons after Wundt, *Grundzuge der Physiologischen Psychologie* (1902), Edward Titchener, trans., (1904), 176.

EQUIPMENT FOR INTERPRETATION	CORRECTIVE PRINCIPLE OF INTERPRETATION (*History of Tradition*)	OBJECT OF INTERPRETATION	ACT OF INTERPRETATION
Practical experience (familiarity with *objects* and *events*).	History of *style* (insight into the manner in which, under varying historical conditions, *objects* and *events* were expressed by *forms*).	I *Primary* or *natural* subject matter—(A) factual, (B) expressional—constituting the world of artistic motifs.	*Pre-iconographical description* (and pseudo-formal analysis).
Knowledge of literary sources (familiarity with specific *themes* and *concepts*).	History of *types* (insight into the manner in which, under varying historical conditions, specific *themes* or *concepts* were expressed by *objects* and *events*).	II *Secondary* or *conventional* subject matter, constituting the world of *images, stories* and *allegories.*	*Iconographical analysis.*
Synthetic intuition (familiarity with the *essential tendencies of the human mind*), conditioned by personal psychology and *"Weltanschauung."*	History of *cultural symptoms* or *"symbols"* in general (insight into the manner in which, under varying historical conditions, *essential tendencies of the human mind* were expressed by specific *themes* and *concepts*).	III *Intrinsic meaning* or *content*, constituting the world of *"symbolical" values.*	*Iconological interpretation.*

Fig. 8. Synoptical table of Panofsky's iconographic method, from "Iconography and Iconology: An Introduction to the Study of Renaissance Art" (1939). After Panofsky, 1982, pp. 40-41.

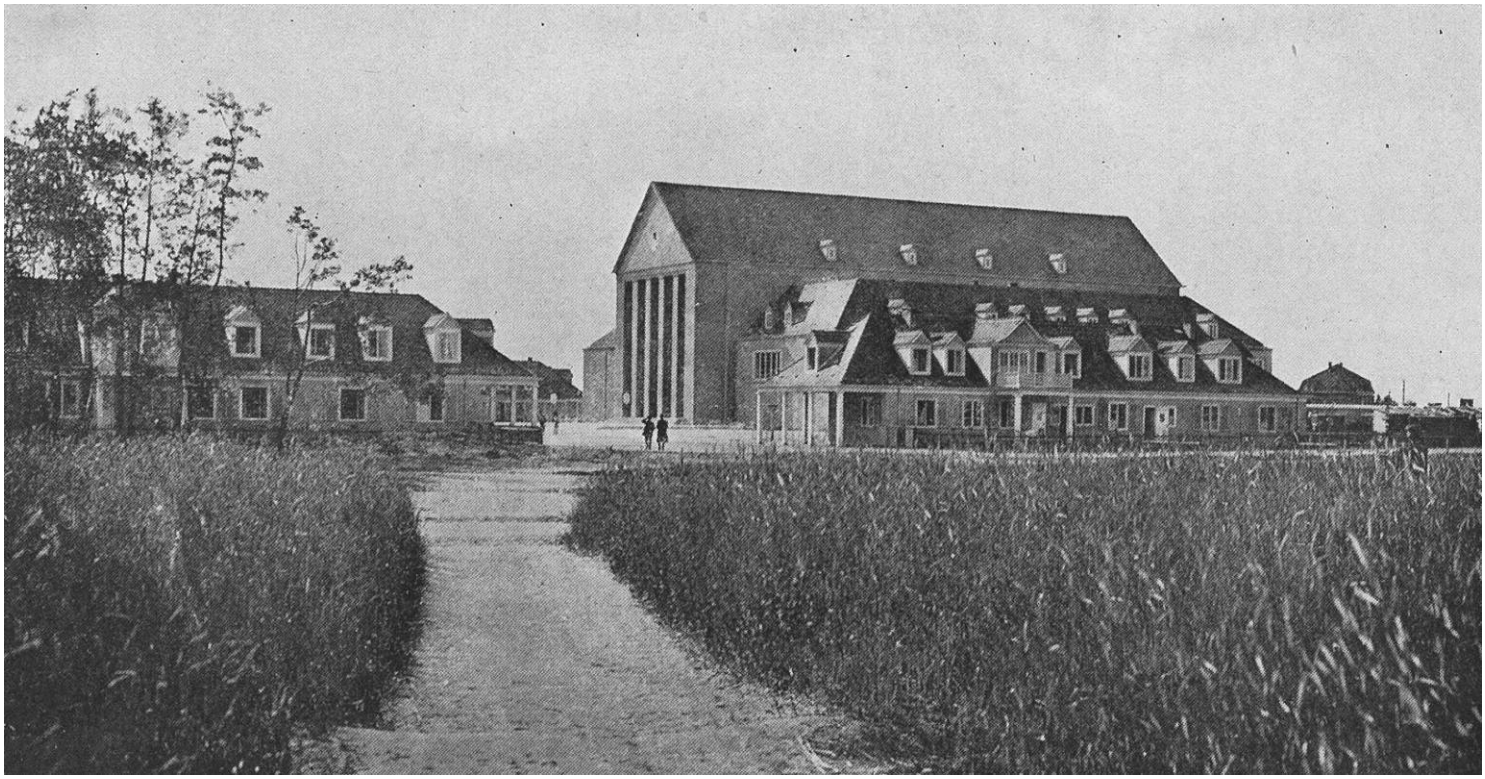


Fig. 9. The Dalcroze Institute in Hellerau, before 1914. After Dalcroze, *Eurhythmics* (1918), p. 41.

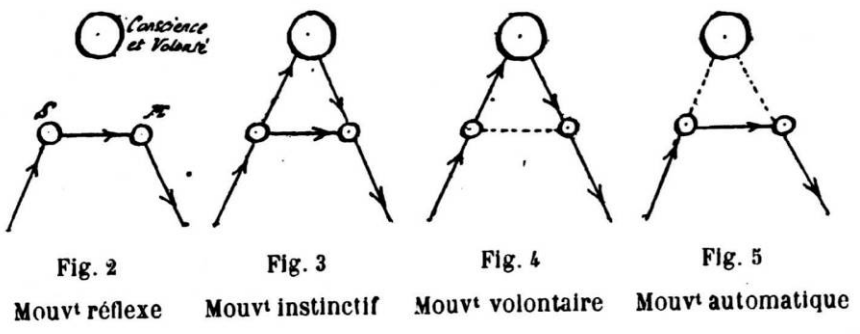


Fig. 10. Edouard Claparède, illustration of four-step "evolution of movement." After Claparède, *Du sens musculaire à propos de quelques cas d'hémiataxie posthémiplégique* (1897), p. 61.

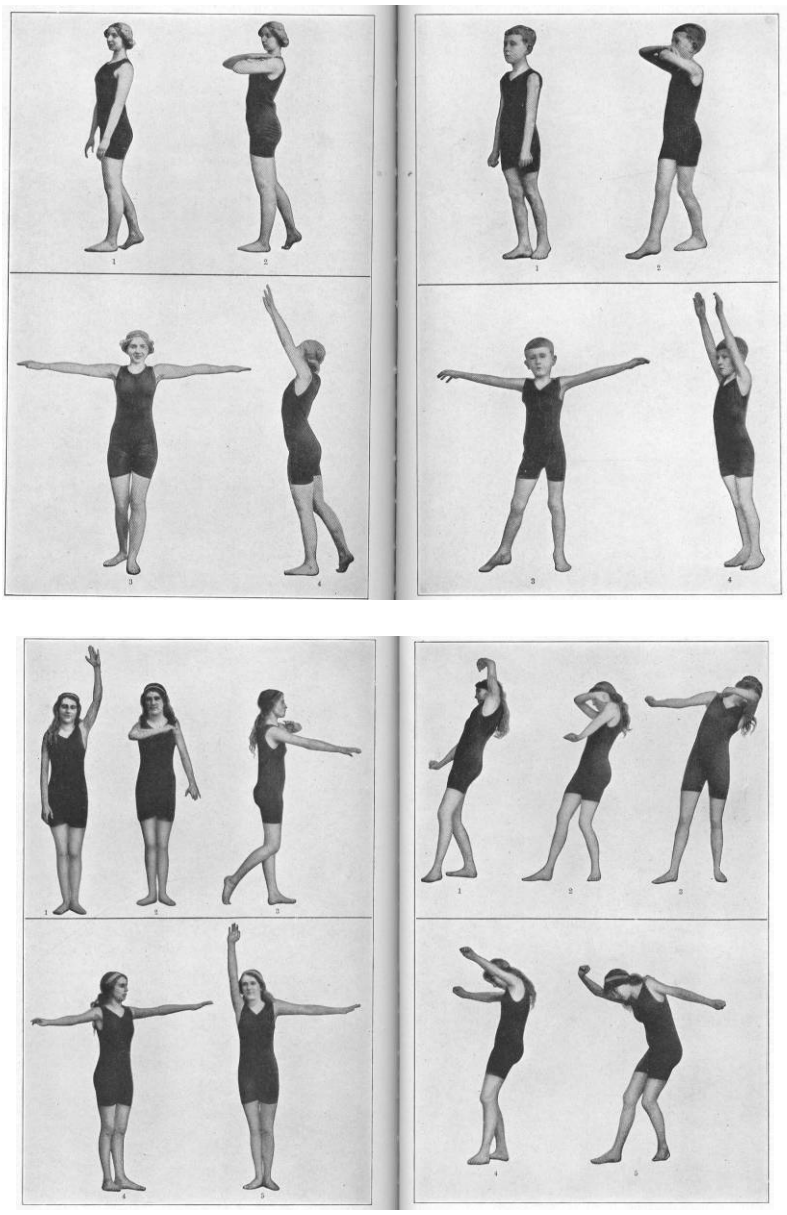


Fig. 11. Illustrations of *Turnen* exercises. After Dalcroze, *Eurhythmics*, (1918), pp. 43, 50.

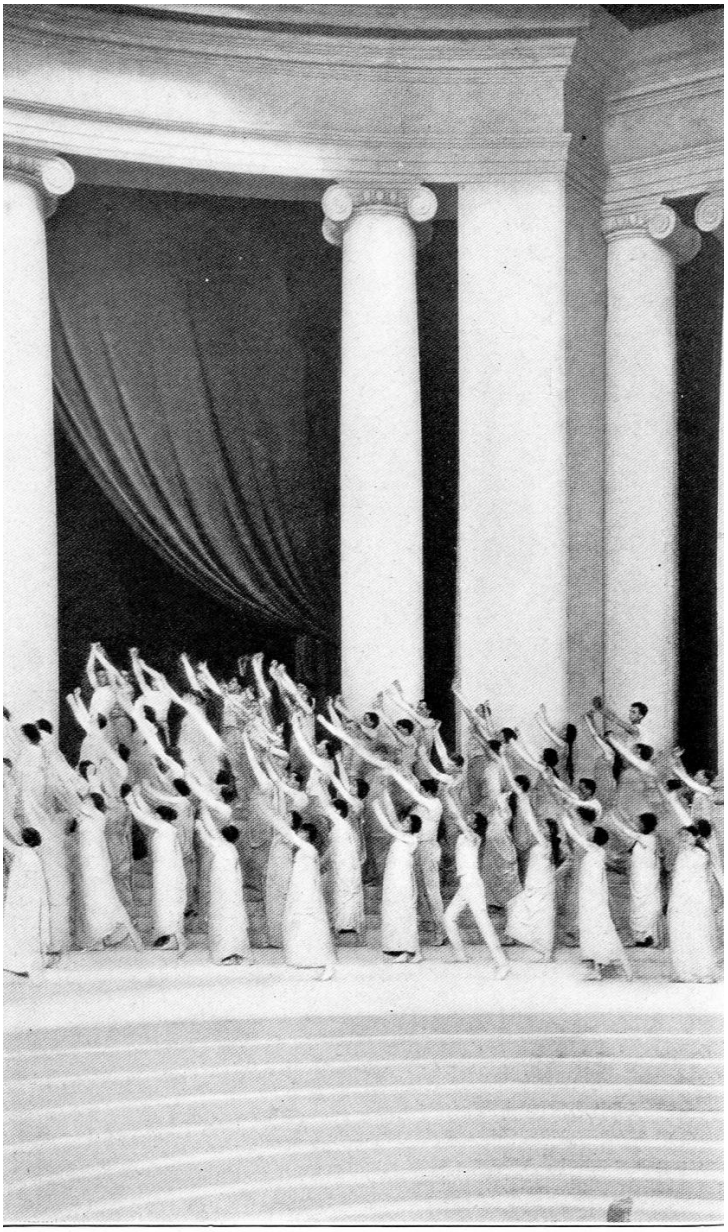
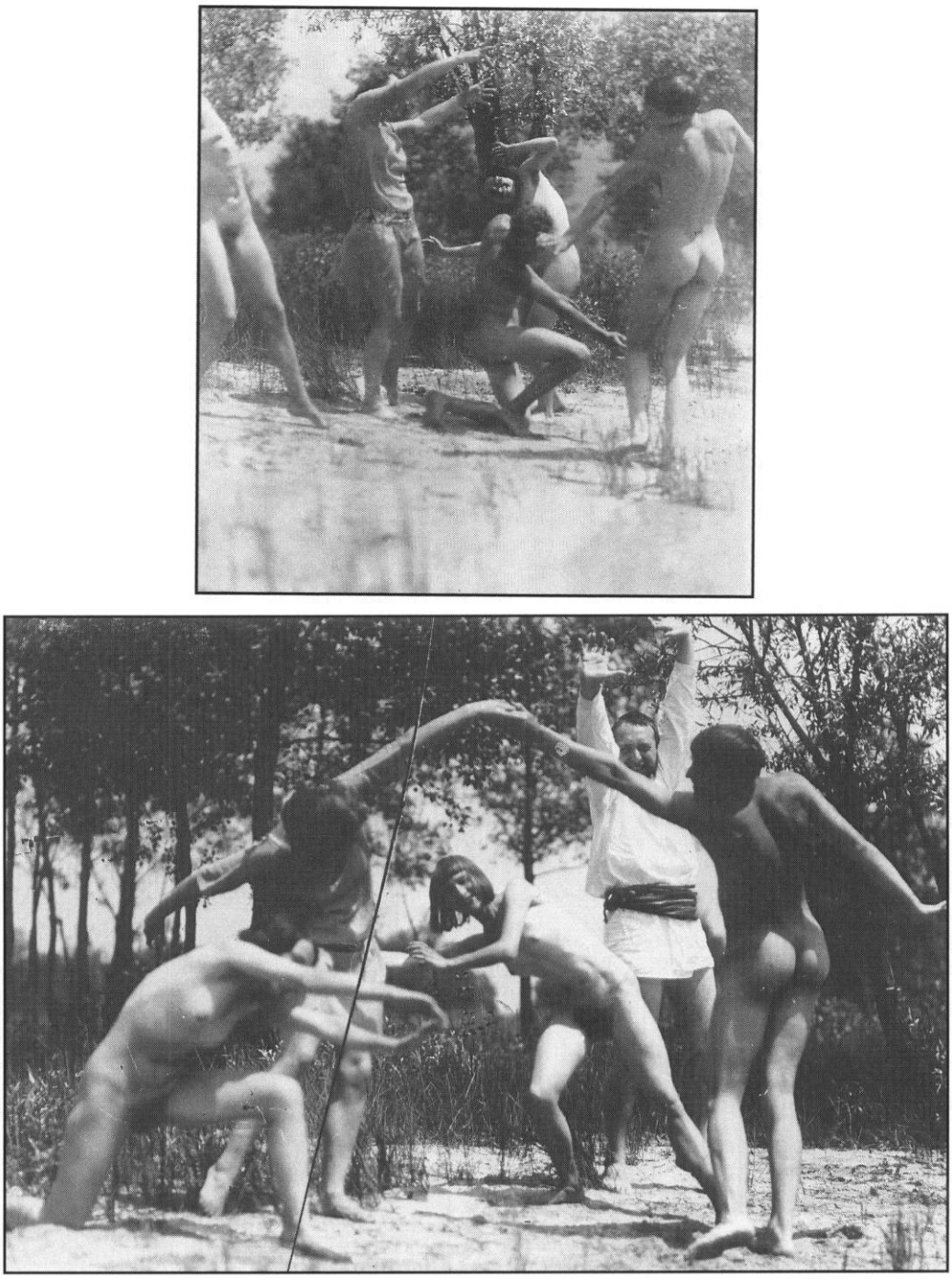


Fig. 12. Ultimate realization of Dalcroze's eurhythmics, *Festspiele* at Hellerau, July 1914, after Dalcroze, Eurhythmics (1918), 34.



Figs. 13-14. Photographs documenting the *Freitanz* exercises of Laban's courses at the Monte Verità commune, Ascona, Switzerland, both c. 1914. After Dörr, 2008, pp. 137-138. Laban is the clothed figure in the bottom photograph wearing the tunic.

Fig. 15. A more formalized "purpose play" featuring the Hamburg Movement Choir in Laban's composition *Der schwingende Tempel*, 1922. After Dörr, 139.

Fig. 16. Left: Marcel Janco, *Untitled*, 1917-1918, painted board and twine, 31 ½ x 18 in. Collection Sylvio Perlstein, Antwerp. Right: Janco, *Portrait of Tzara*, 1919, paper, board, burlap, ink, and gouache, 21 ½ x 10 x 2 ¾ in. Paris, Centre Pompidou. After Dickerman et al, (2005), pp. 50-51.

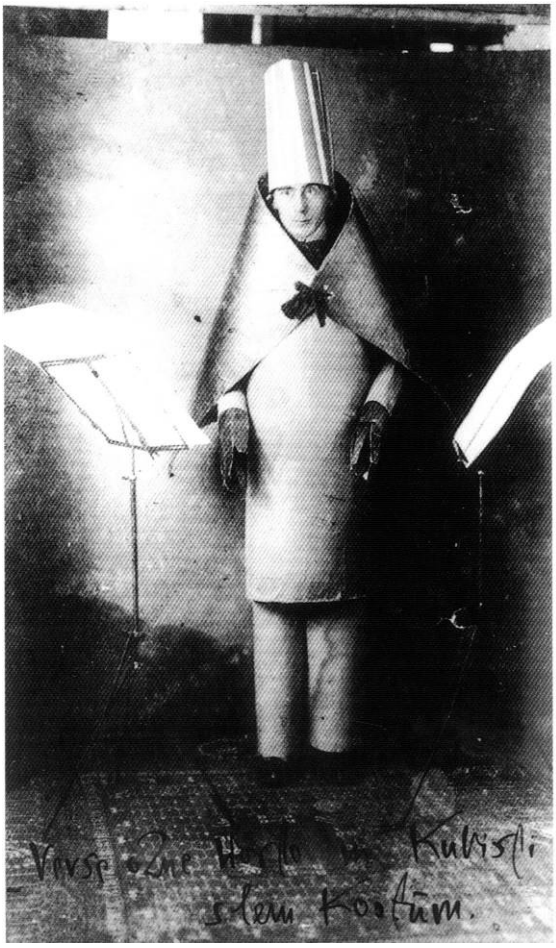


Fig. 17. Hugo Ball in costume reciting his sound poems, June 23, 1916. Collection Kunsthaus, Zürich.

Fig. 18. Sophie Taeuber dancing, c. 1917. Mask by Janco, costume possibly by Hans Arp. Clamart, Fondation Arp. After Dickerman (2005), 16.

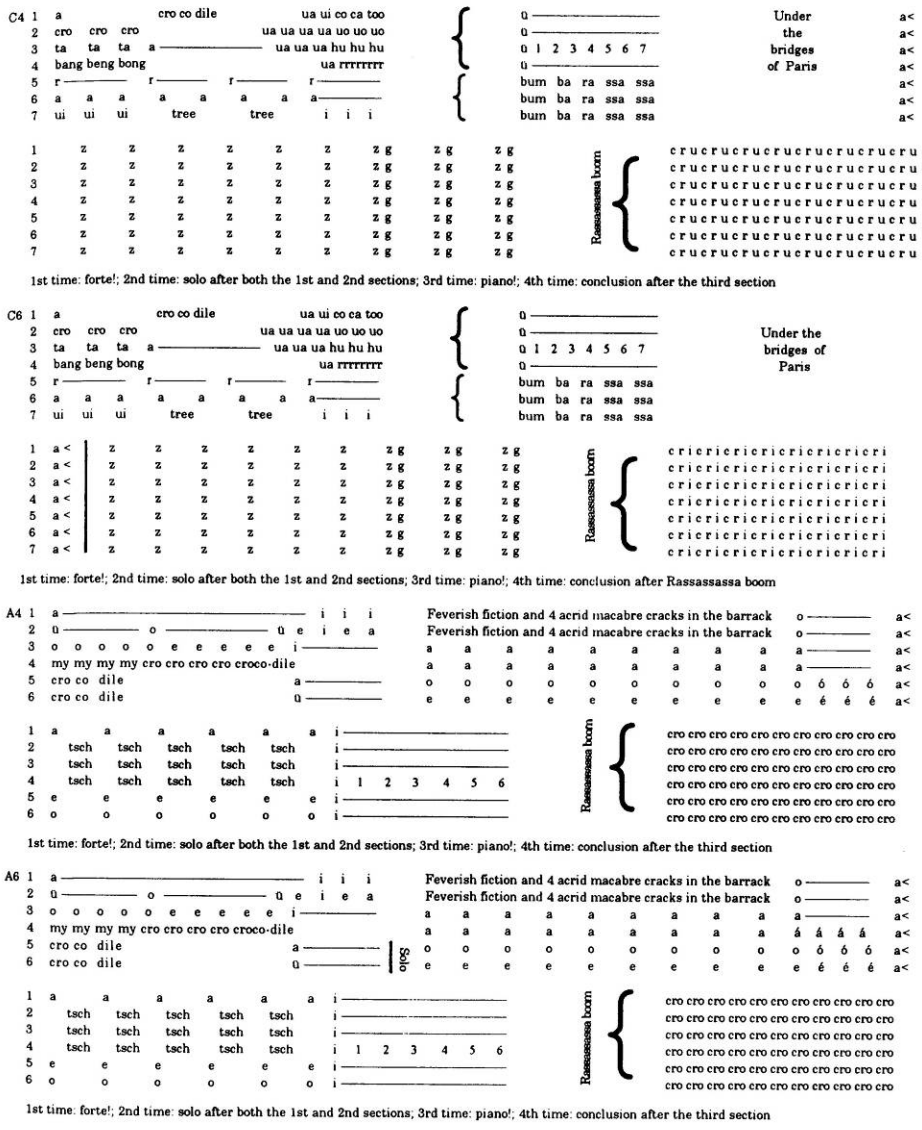
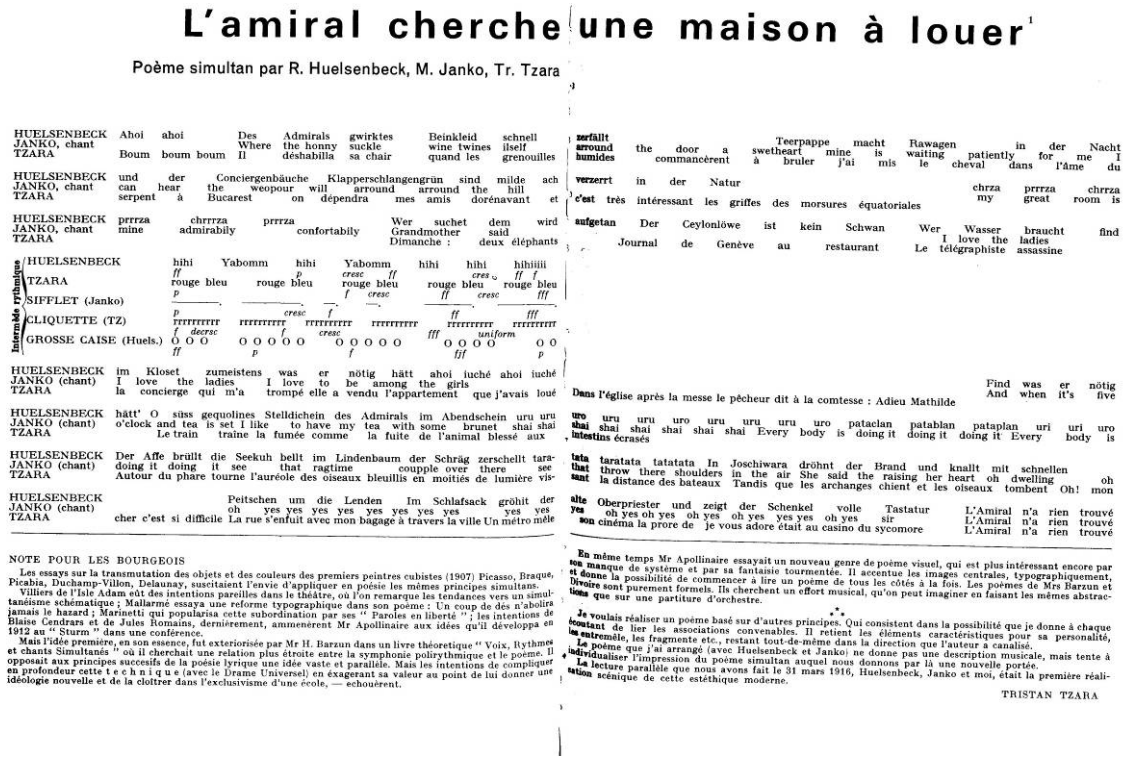


Fig. 19. Tristan Tzara, typescript for *La Fièvre du mâle*, 1919. After Green, 1990.



L'amiral cherche une maison à louer[1]

Poème simultan par R. Huelsenbeck, M. Janko, Tr. Tzara

HUELSENBECK Ahoi ahoi Des Admirals gwirktes Beinkleid schnell
JANKO, chant Where the honny suckle wine twines ilself
TZARA Boum boum boum Il déshabilla sa chair quand les grenouilles

HUELSENBECK und der Conciergenbäuche Klapperschlangengrün sind milde ach
JANKO, chant can hear the weopour will arround arround the hill
TZARA serpent à Bucarest on dépendra mes amis dorénavant et

HUELSENBECK prrrza chrrrza prrrza Wer suchet dem wird
JANKO, chant mine admirabily confortabily Grandmother said
TZARA Dimanche : deux éléphants

Intermède rythmique
HUELSENBECK hihi Yabomm hihi Yabomm hihi hihi hihiiii
TZARA rouge bleu rouge bleu rouge bleu rouge bleu rouge bleu
SIFFLET (Janko)
CLIQUETTE (TZ)
GROSSE CAISE (Huels.)

HUELSENBECK im Kloset zumeistens was er nötig hätt ahoi iuché ahoi iuché
JANKO (chant) I love the ladies I love to be among the girls
TZARA la concierge qui m'a trompé elle a vendu l'appartement que j'avais loué

HUELSENBECK hätt' O süss gequolines Stelldichein des Admirals im Abendschein uru uru
JANKO (chant) o'clock and tea is set I like to have my tea with some brunet shai shai
TZARA Le train traîne la fumée comme la fuite de l'animal blessé aux

HUELSENBECK Der Affe brüllt die Seekuh bellt im Lindenbaum der Schräg zerschellt tara-
JANKO (chant) doing it doing it see that ragtime coupple over there see
TZARA Autour du phare tourne l'auréole des oiseaux bleuillis en moitiés de lumière vis-

HUELSENBECK Peitschen um die Lenden Im Schlafsack gröhit der
JANKO (chant) oh yes yes yes yes yes yes yes yes yes
TZARA cher c'est si difficile La rue s'enfuit avec mon bagage à travers la ville Un métro mêle

zerfällt Teerpappe macht Rawagen in der Nacht
arround the door a swetheart mine is waiting patiently for me I
humides commancèrent à bruler j'ai mis le cheval dans l'âme du

verzerrt in der Natur chrza prrrza chrrza
c'est très intéressant les griffes des morsures équatoriales my great room is

aufgetan Der Ceylonlöwe ist kein Schwan Wer Wasser braucht find
Journal de Genève au restaurant I love the ladies
Le télégraphiste assassine

Find was er nötig
Dans l'église après la messe le pêcheur dit à la comtesse : Adieu Mathilde And when it's five

uro uru uru uro uru uru uro pataclan patablan pataplan uri uri uro
shai shai shai shai shai Every body is doing it doing it doing it Every body is
intestins écrasés

tata taratata tatatata In Joschiwara dröhnt der Brand und knallt mit schnellen
that throw there shoulders in the air She said the raising her heart oh dwelling oh
sant la distance des bateaux Tandis que les archanges chient et les oiseaux tombent Oh! mon

alte Oberpriester und zeigt der Schenkel volle Tastatur L'Amiral n'a rien trouvé
yes oh yes oh yes oh yes oh yes yes yes oh yes sir L'Amiral n'a rien trouvé
son cinéma la prore de je vous adore était au casino du sycomore L'Amiral n'a rien trouvé

NOTE POUR LES BOURGEOIS

Les essays sur la transmutation des objets et des couleurs des premiers peintres cubistes (1907) Picasso, Braque, Picabia, Duchamp-Villon, Delaunay, suscitaient l'envie d'appliquer en poésie les mêmes principes simultans.

Villiers de l'Isle Adam eût des intentions pareilles dans le théâtre, où l'on remarque les tendances vers un simultanéisme schématique ; Mallarmé essaya une reforme typographique dans son poème : Un coup de dés n'abolira jamais le hazard ; Marinetti qui popularisa cette subordination par ses " Paroles en liberté " ; les intentions de Blaise Cendrars et de Jules Romains, dernièrement, ammenèrent Mr Apollinaire aux idées qu'il développa en 1912 au " Sturm " dans une conférence.

Mais l'idée première, en son essence, fut exteriorisée par Mr H. Barzun dans un livre théoretique " Voix, Rythmes et chants Simultanés " où il cherchait une relation plus étroite entre la symphonie polirythmique et le poème. Il opposait aux principes successifs de la poésie lyrique une idée vaste et parallèle. Mais les intentions de compliquer en profondeur cette t e c h n i q u e (avec le Drame Universel) en éxagerant sa valeur au point de lui donner une idéologie nouvelle et de la cloîtrer dans l'exclusivisme d'une école, — echouèrent.

En même temps Mr Apollinaire essayait un nouveau genre de poème visuel, qui est plus intéressant encore par son manque de syntème et par sa fantaisie tourmentée. Il accentue les images centrales, typographiquement, et donne la possibilité de commencer à lire un poème de tous les côtés à la fois. Les poèmes de Mrs Barzun et Désoire sont purement formels. Ils cherchent un effort musical, qu'on peut imaginer en faisant les mêmes abstractions que sur une partiture d'orchestre.

***

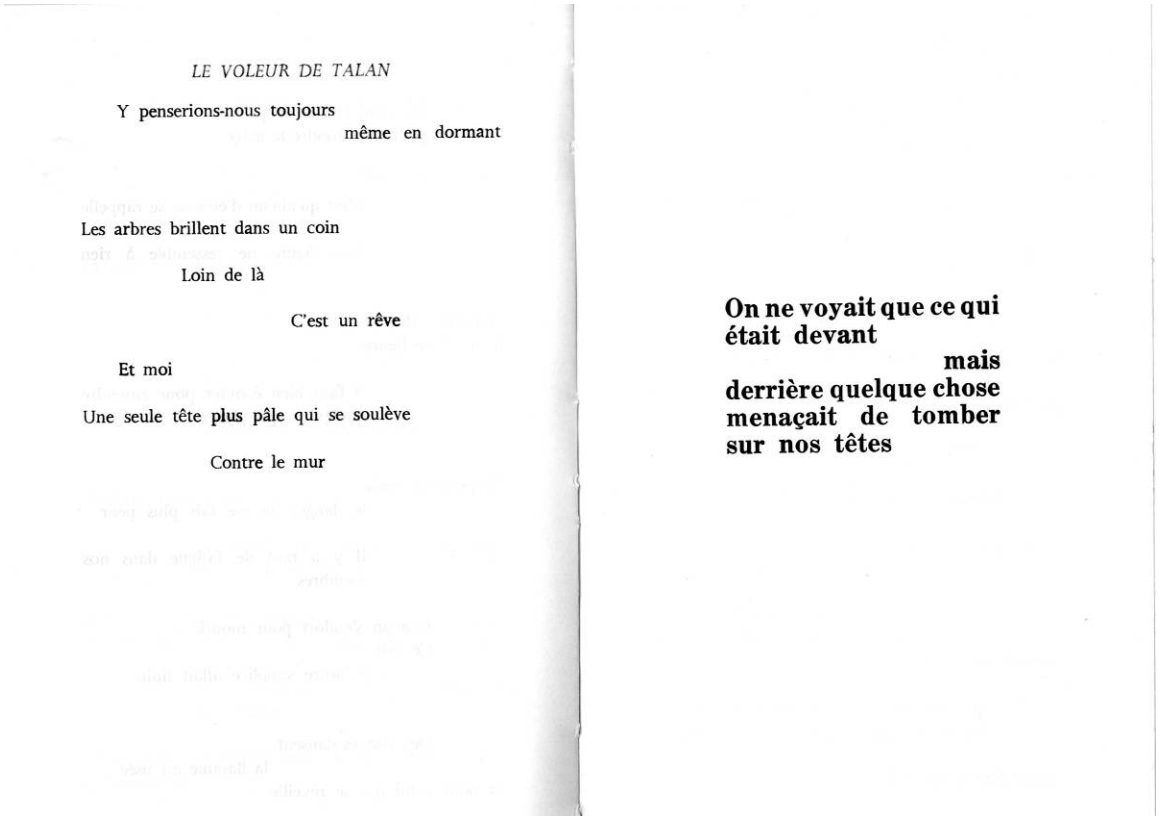
Je voulais réaliser un poème basé sur d'autres principes. Qui consistent dans la possibilité que je donne à chaque écoutant de lier les associations convenables. Il retient les éléments caractéristiques pour sa personalité, les entremêle, les fragmente etc., restant tout-de-même dans la direction que l'auteur a canalisé.

Le poème que j'ai arrangé (avec Huelsenbeck et Janko) ne donne pas une description musicale, mais tente à individualiser l'impression du poème simultan auquel nous donnons par là une nouvelle portée.

La lecture parallèle que nous avons fait le 31 mars 1916, Huelsenbeck, Janko et moi, était la première réalisation scénique de cette estéthique moderne.

TRISTAN TZARA

Fig. 20. Tzara, typescript for *L'amiral cherche une maison à louer*, 1916. After Tzara, *Oeuvres complètes*, vol. 1, 541.



LE VOLEUR DE TALAN

Y penserions-nous toujours
même en dormant

Les arbres brillent dans un coin
Loin de là

C'est un rêve

Et moi
Une seule tête plus pâle qui se soulève

Contre le mur

On ne voyait que ce qui était devant
mais
derrière quelque chose menaçait de tomber sur nos têtes

Fig. 21. Pierre Reverdy, *Le Voleur du Talan*, 1917. Paris: Flammarion.

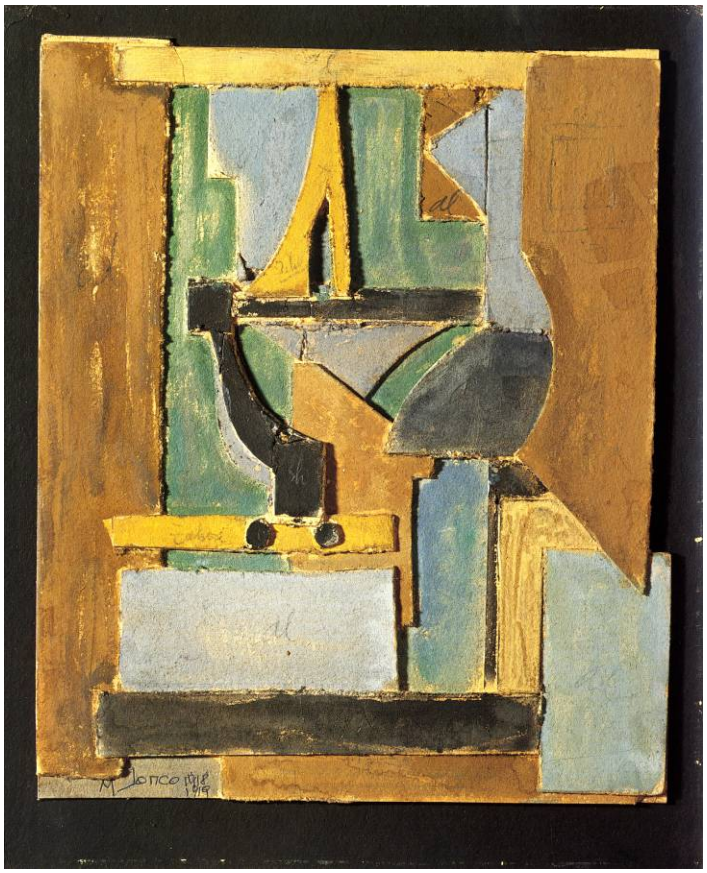


Fig 22. Marcel Janco, *Study for Brilliant Empire Architecture*, 1918. Collage, 14 ½ x 12 in. Zurich, Kunsthaus. After Kuenzli (2006), fig. 52.

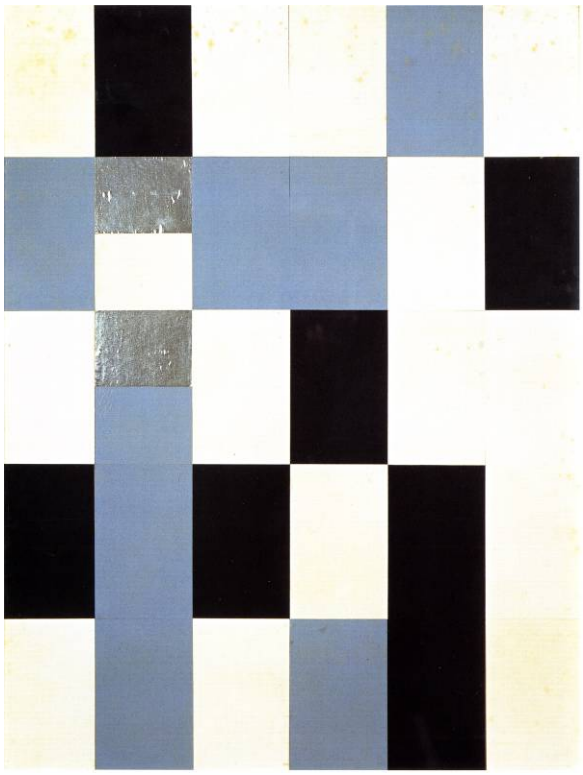


Fig. 23. Sophie Taeuber-Arp and Hans Arp, *Duo Collage*, 1918. Collage, 32 x 24 ½ in. Neuss, Museum Insel Hombroich. After Keunzli (2006), page 64.

Fig. 24. Hans Arp, *Untitled (Collage arranged according to the laws of chance)*, 1916-1917. Collage, 10 x 5 in. Basel, Kunstmuseum. After Kuenzli (2006), page 55.

Fig. 25. Arp, *Untitled*, 1916. Ink was on paper, 17 x 24 in. New York, Museum of Modern Art. After Kuenzli (2006), page 54.

Fig. 26. Arp, *Untitled*, 1916-1917. Painted wood relief, 16 x 13 x 4 in. Zurich, Kunsthaus. After Kuenzli (2006), page 54.

Fig. 27. Theatre by Henry van de Velde, built for Werkbund exhibition in Cologne, 1914. After Schwartz, fig. 2.

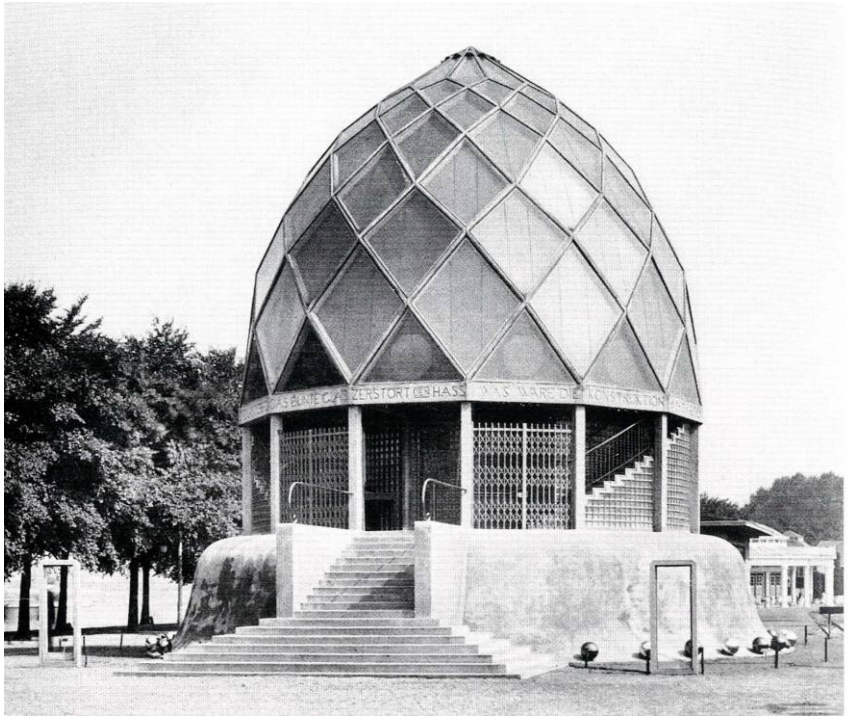


Fig. 28. Glass house by Bruno Taut with Franz Hoffmann, built for Werkbund exhibition, Cologne 1914. After Schwartz, fig. 84.

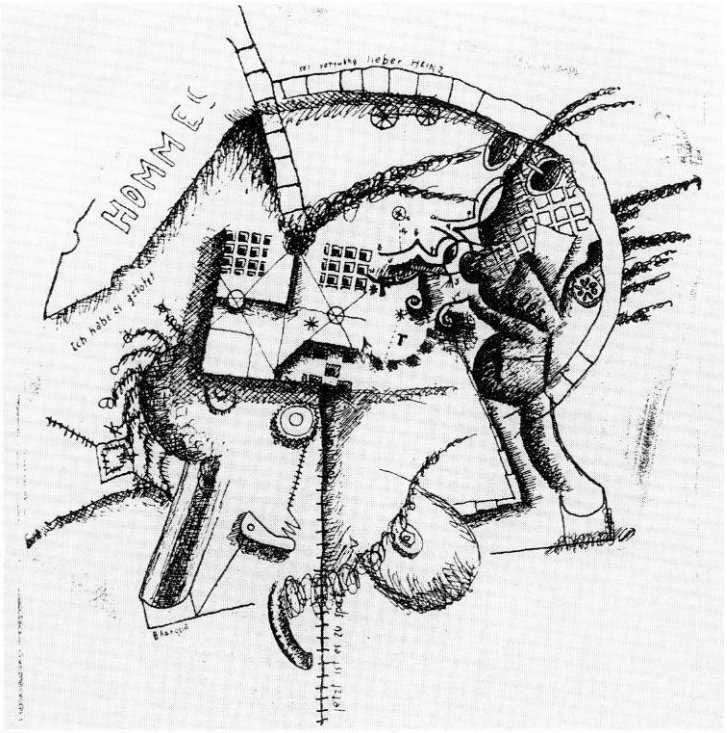


Fig. 29. Johannes Baargeld, *Men/Be Careful Dear Heinz*, c. 1920. Reproduced in *die schammade*, April 1920. Presumed lost. After Camfield, fig. 90.

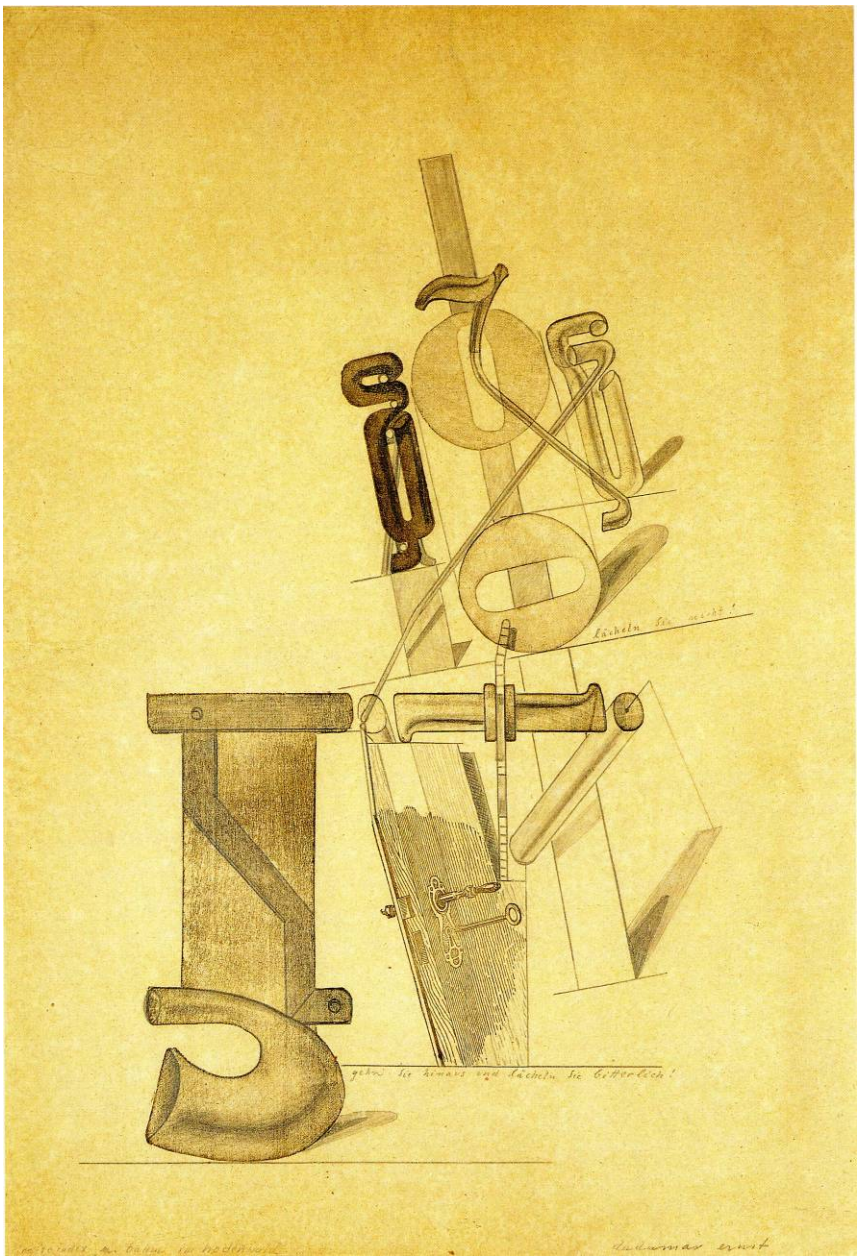


Fig. 30. Max Ernst, *Don't Smile*, ca. 1920. Pencil rubbings of printer's blocks with charcoal on paper, 18 ½ x 12 ½ in. Private collection. After Camfield, plate 44.

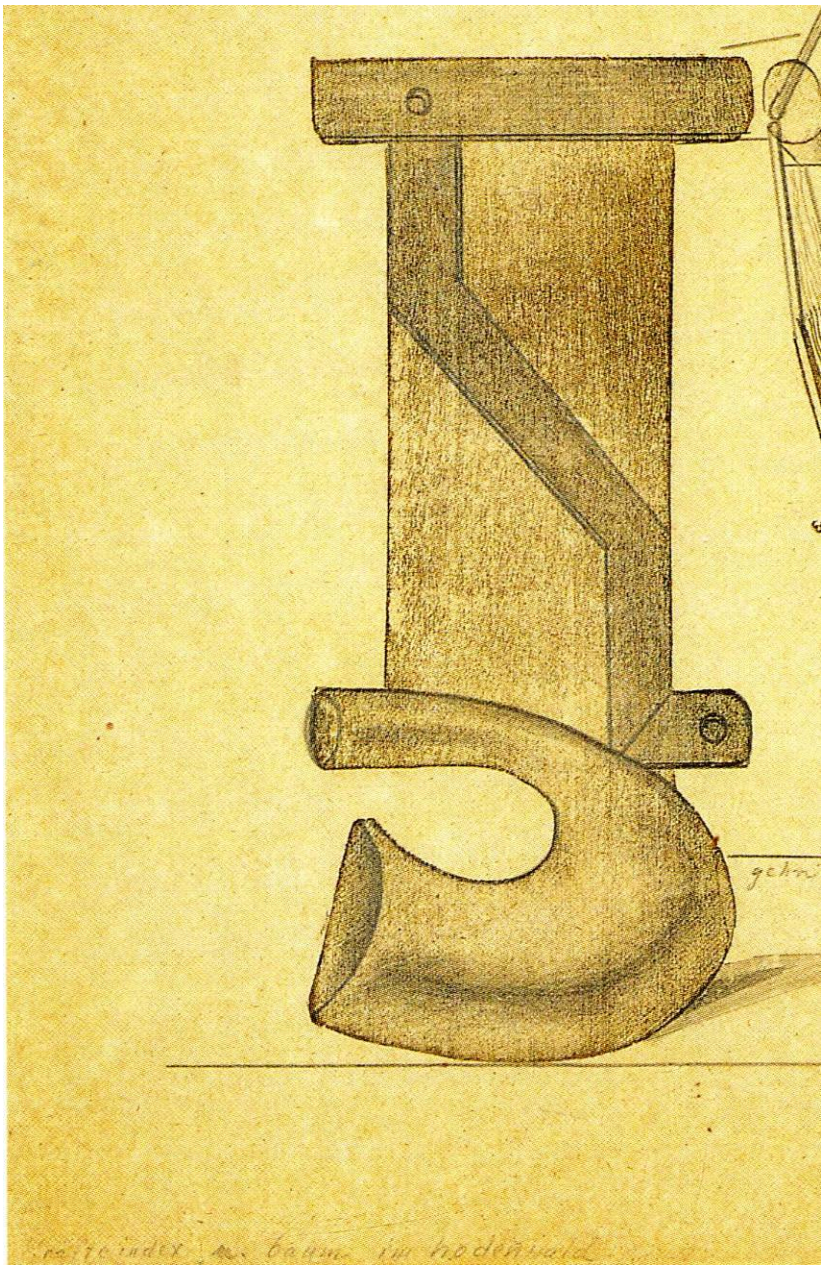


Fig. 31. Lower left detail of *Don't Smile*

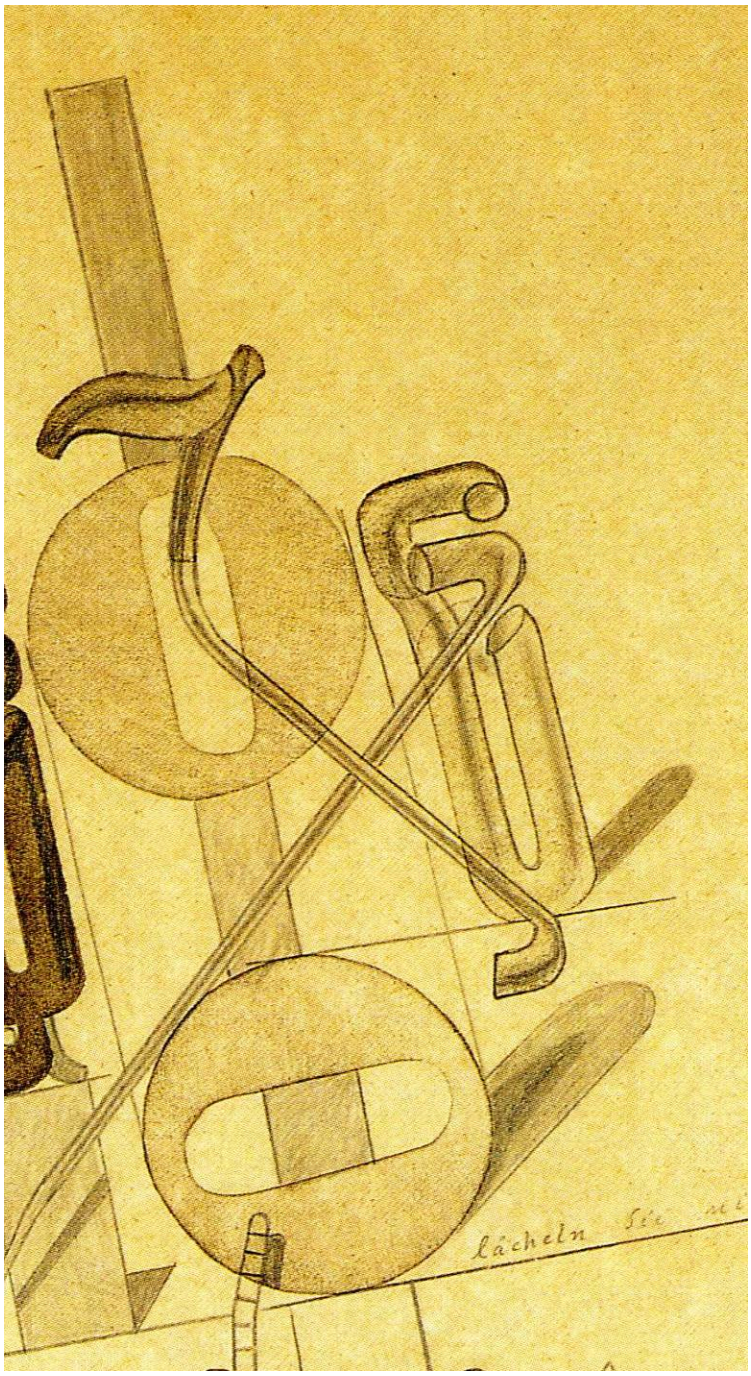


Fig. 32. Detail of upper left of *Don't Smile*

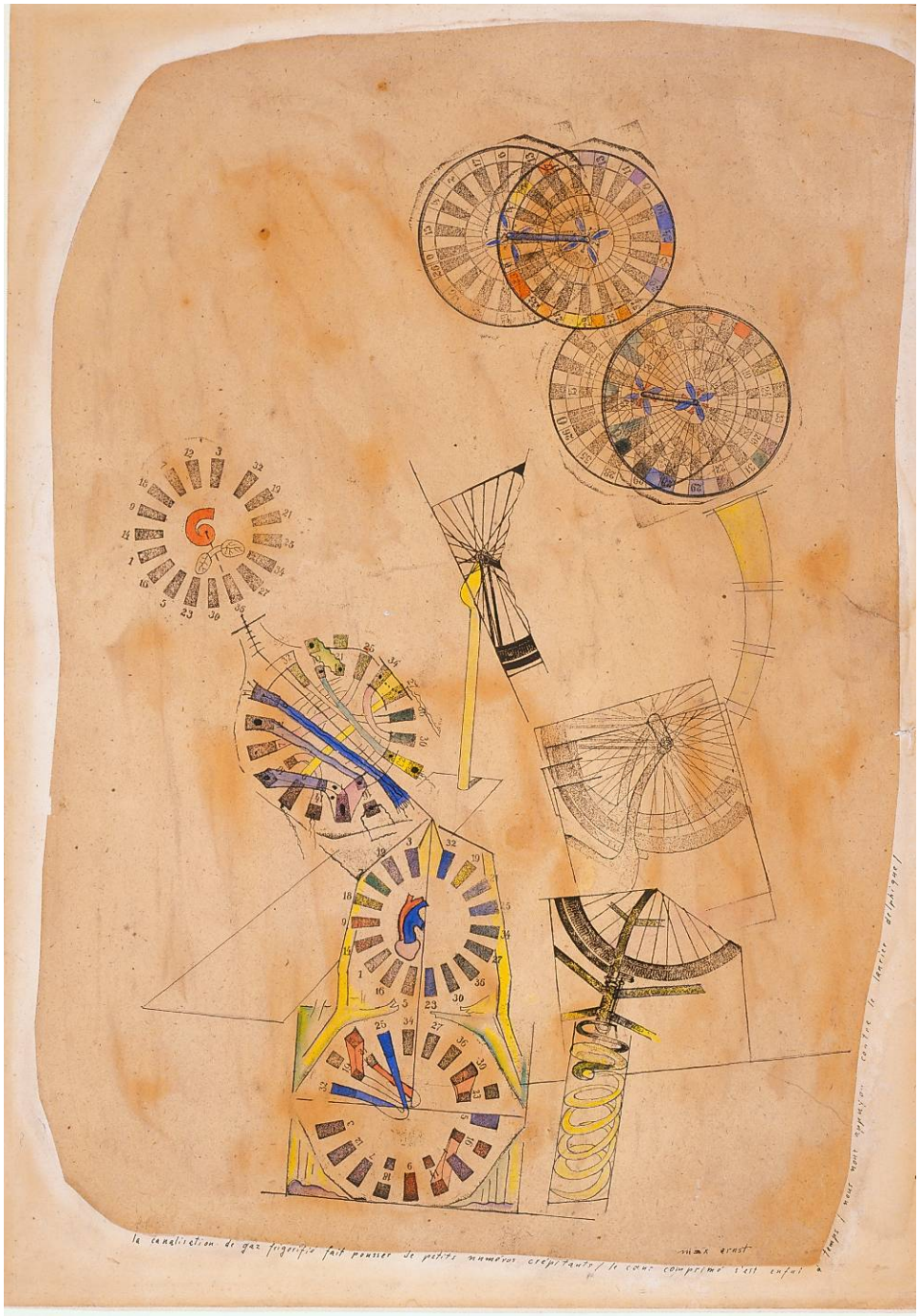


Fig. 33. Ernst, *Canalization of Refrigerated Gas*, 1920. Stamps of printer's blocks with ink, watercolor, and gouache on paper mounted on paper, 21 ¼ x 15 in. Houston, Menil Collection. Photograph courtesy Menil Collection

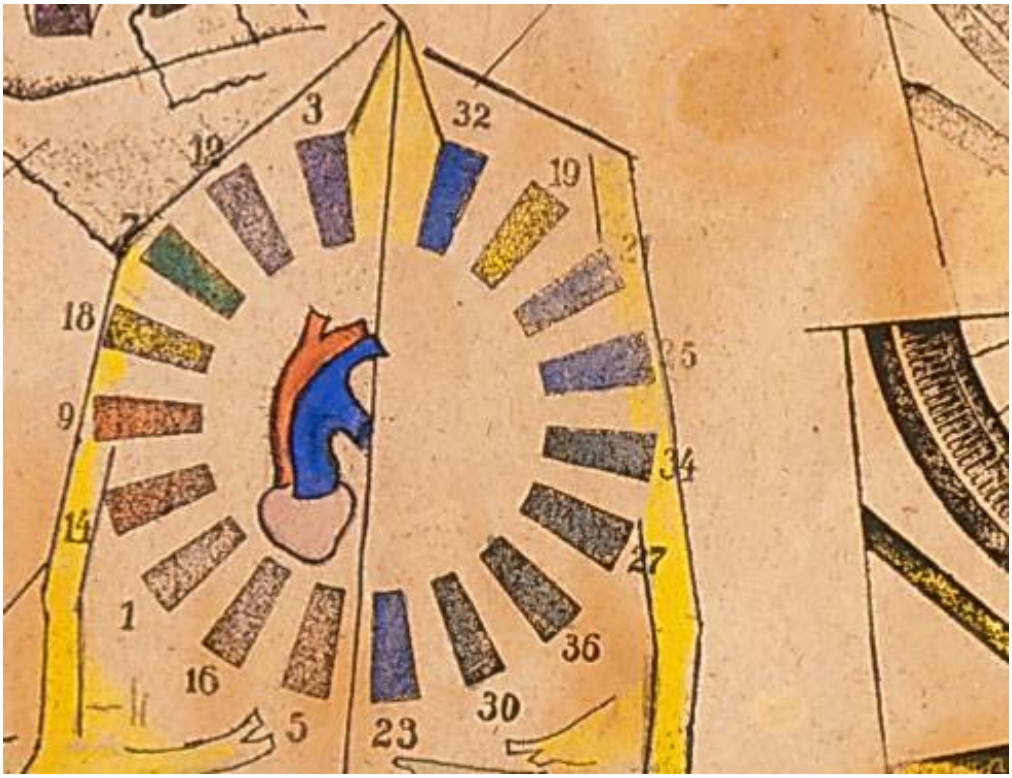


Fig. 34. Detail of center of *Canalization of Refrigerated Gas*, showing heart and arteries.

Fig. 35. Detail of *Canalization* showing visual representation of lungs.

Fig. 36. Detail of *Canalization* showing alteration of roulette wheel stamp into nerve endings.

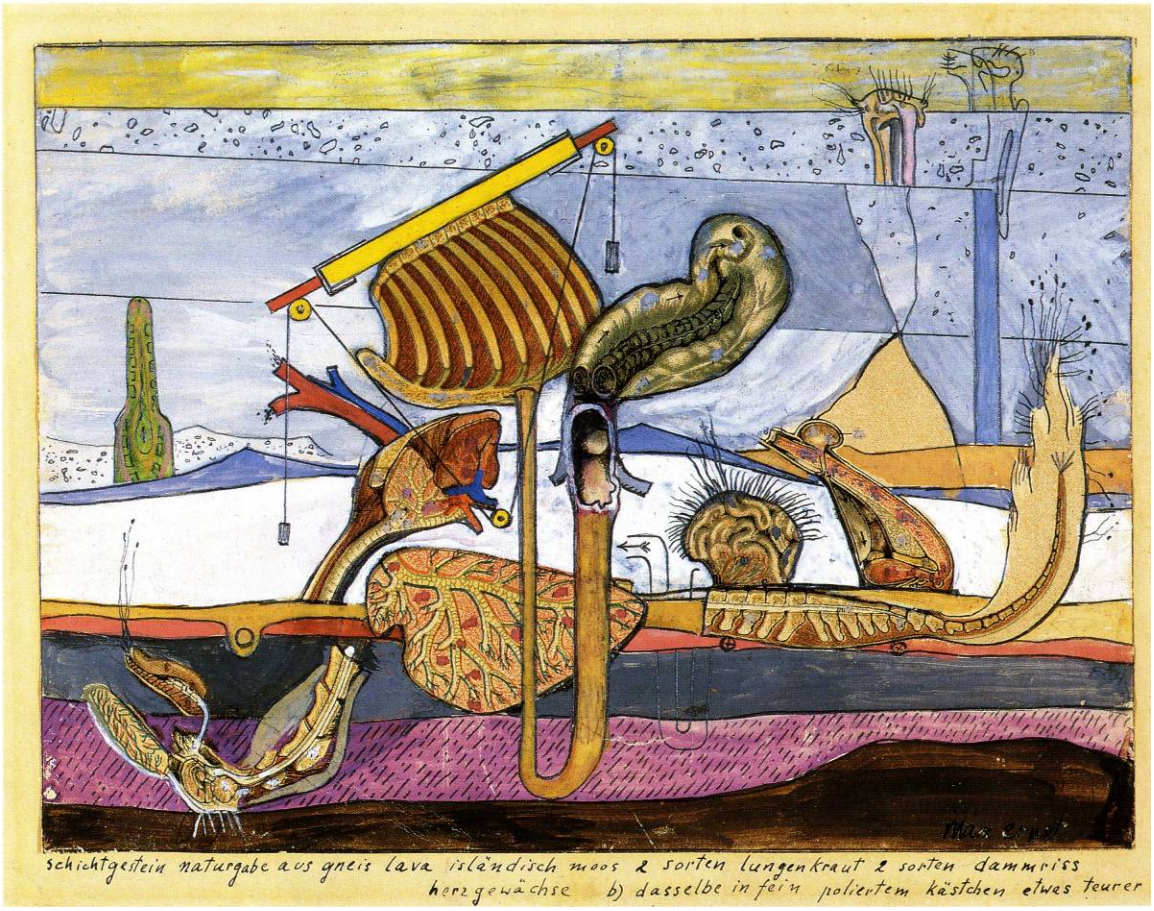


Fig. 37. Ernst, *Stratified Rocks*, 1920. Gouache and ink on printed reproduction, 6 x 8 1/8 in. New York, Museum of Modern Art. After Camfield, plate 84.

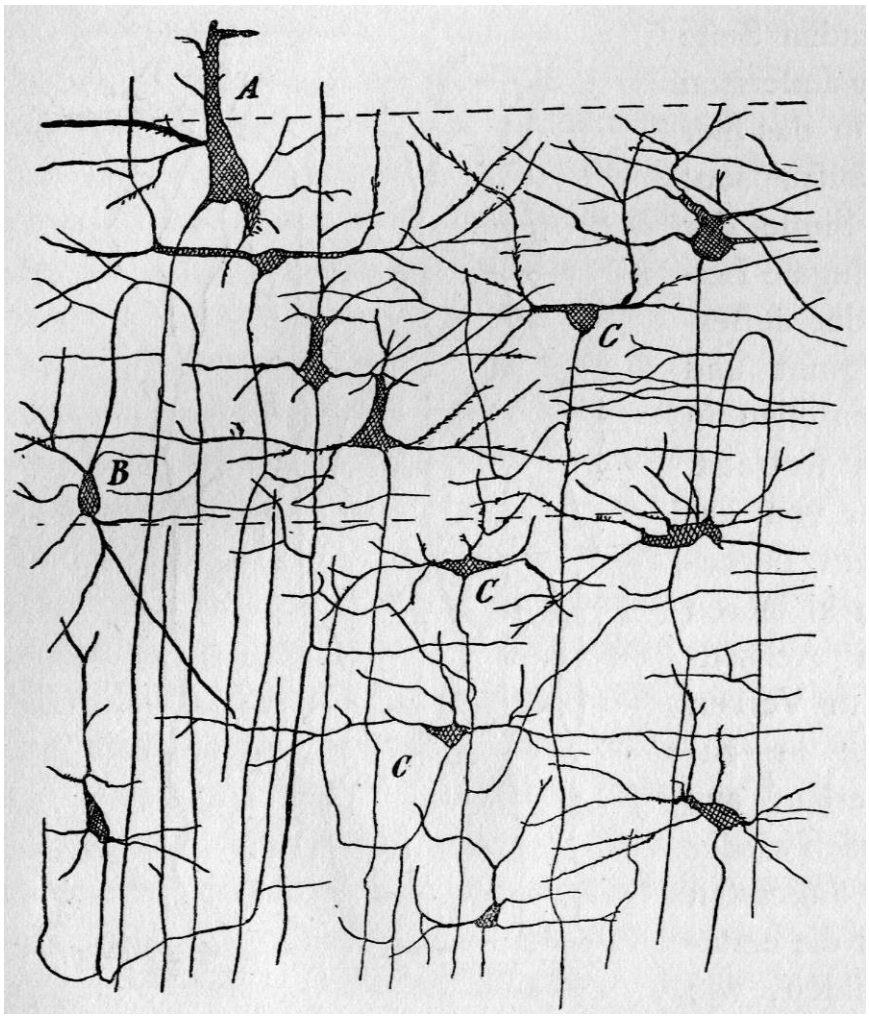


Fig. 38. Cross section of human nerves in the skin, based on histological microscopic excisions. After Wundt, *Grundzüge* (4th ed. 1892), 272.

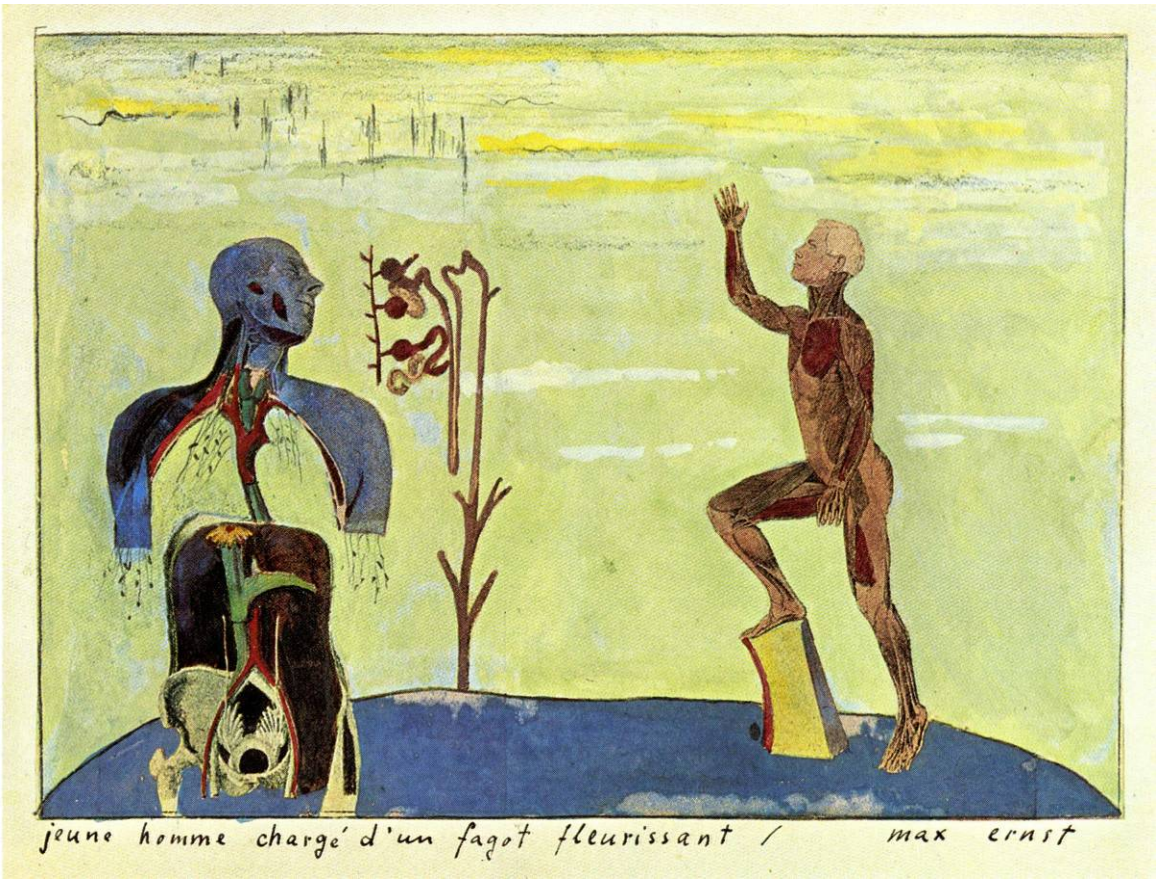


Fig. 39. Ernst, *jeune homme chargé d'un fagot fleurissant*, 1920. Gouache and ink on printed reproduction, 4 ½ x 6 in. Private collection. After Camfield, plate 60.

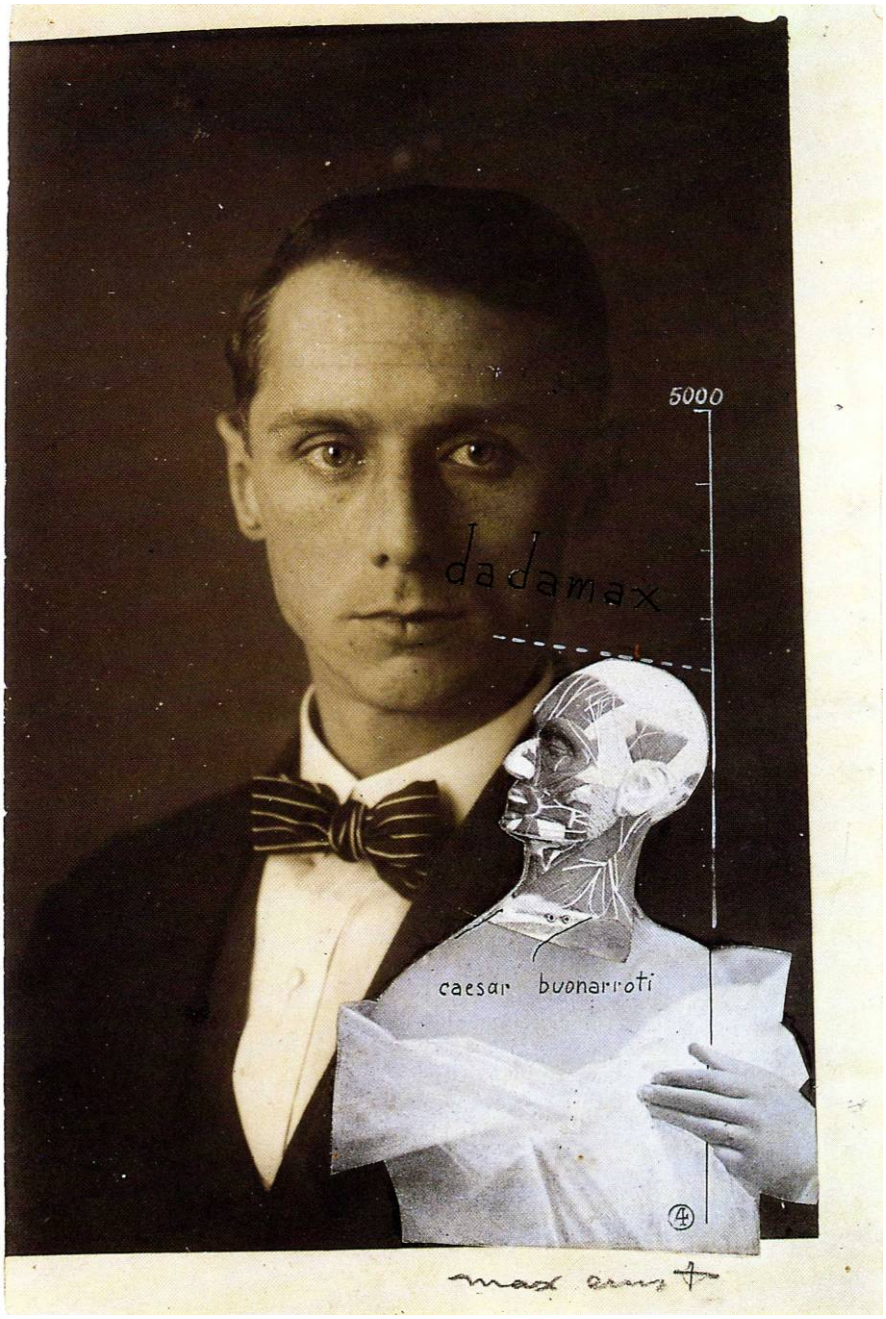


Fig. 40. Ernst, *The Punching Ball ou l'immortalite de buonarotti*, 1920. Collage, gouache, and ink on photograph, 7 x 4/12 in. Chicago, Crane collection. After Camfield, plate 67.

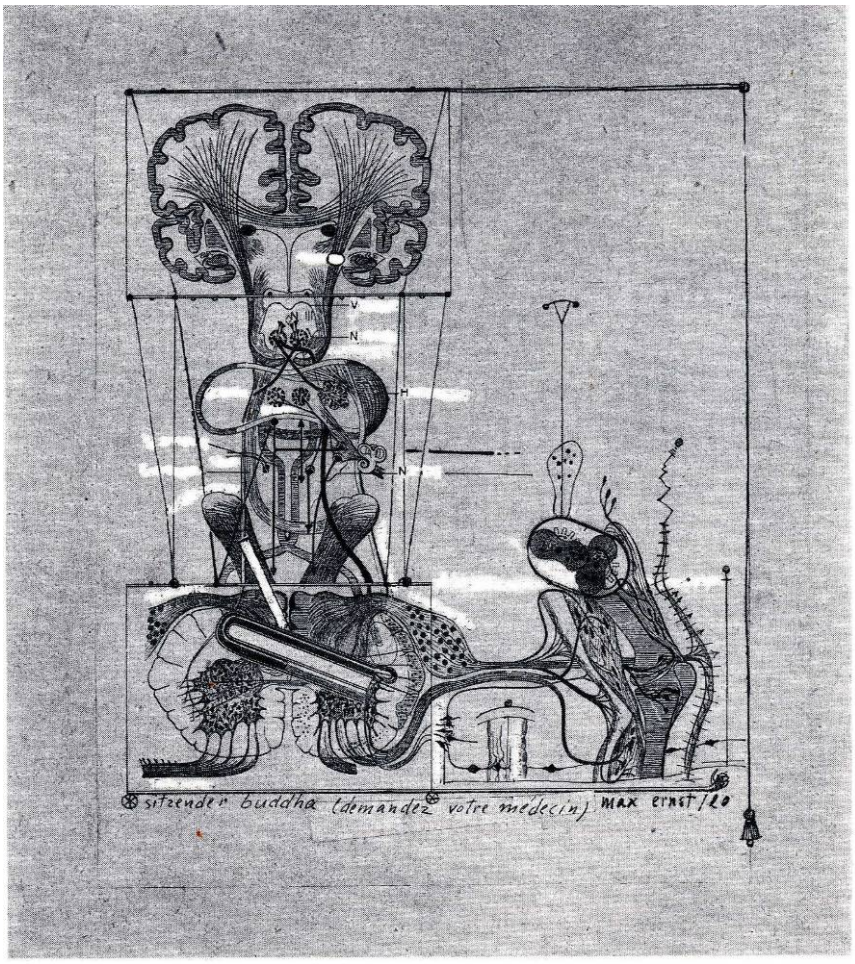


Fig. 41. Ernst, *Sitzender Buddha*, 1920. Gouache and ink on printed reproduction, 8 1/8 x 7 7/8 in. Robinson Collection. After Camfield, fig. 85.

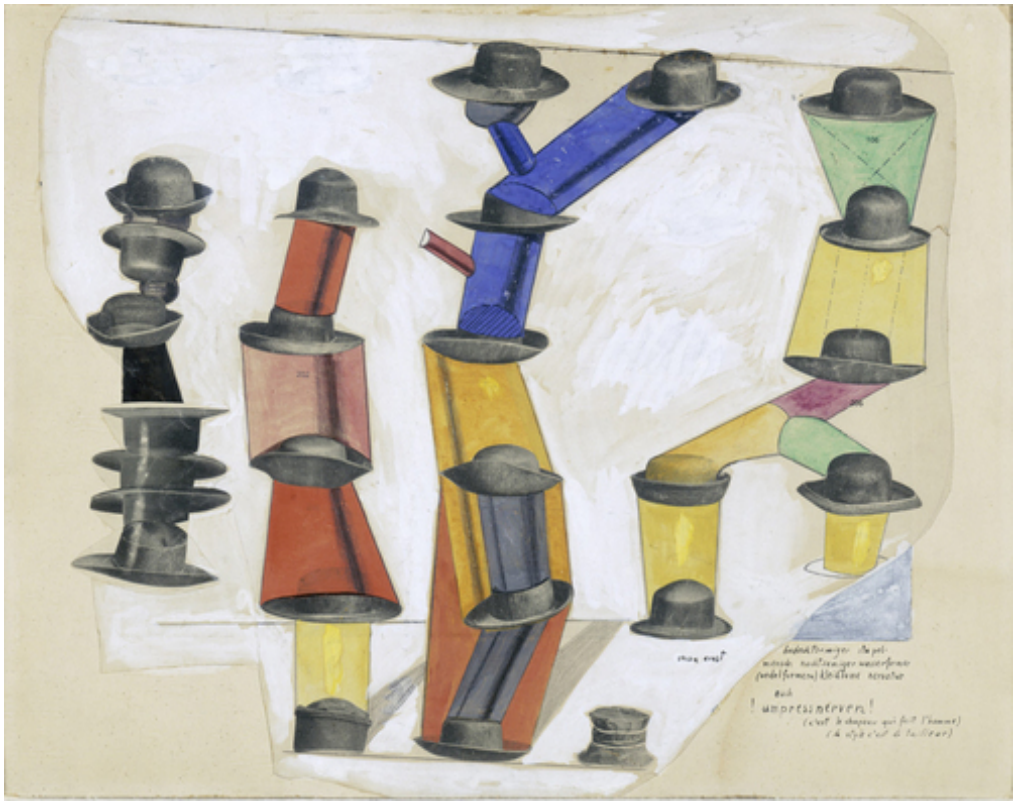


Fig. 42. Ernst, The Hat Makes the Man, 1920. Collage, watercolor, gouache, and ink on paper, 14 x 18 in. New York, The Museum of Modern Art. After Camfield, plate 55.

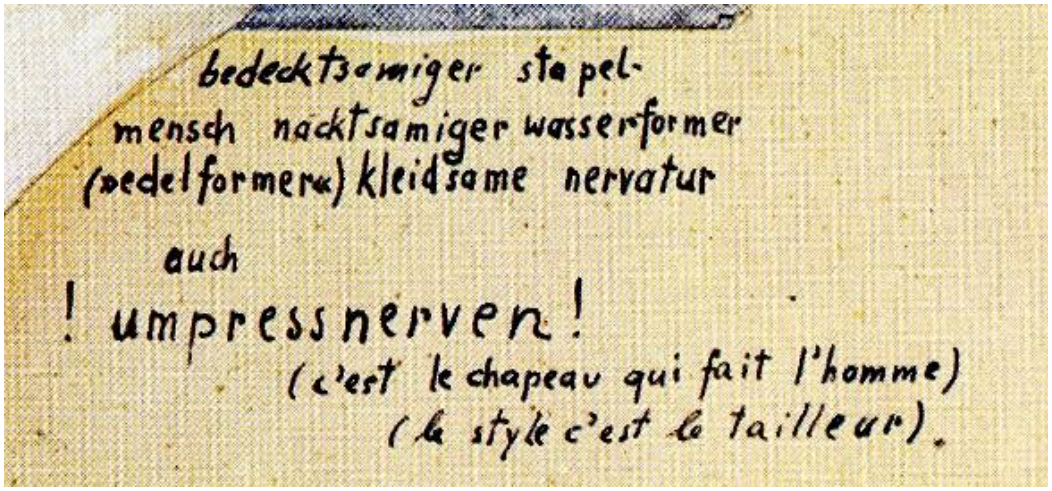


Fig. 43. Detail of lower right corner of *The Hat Makes the Man*.

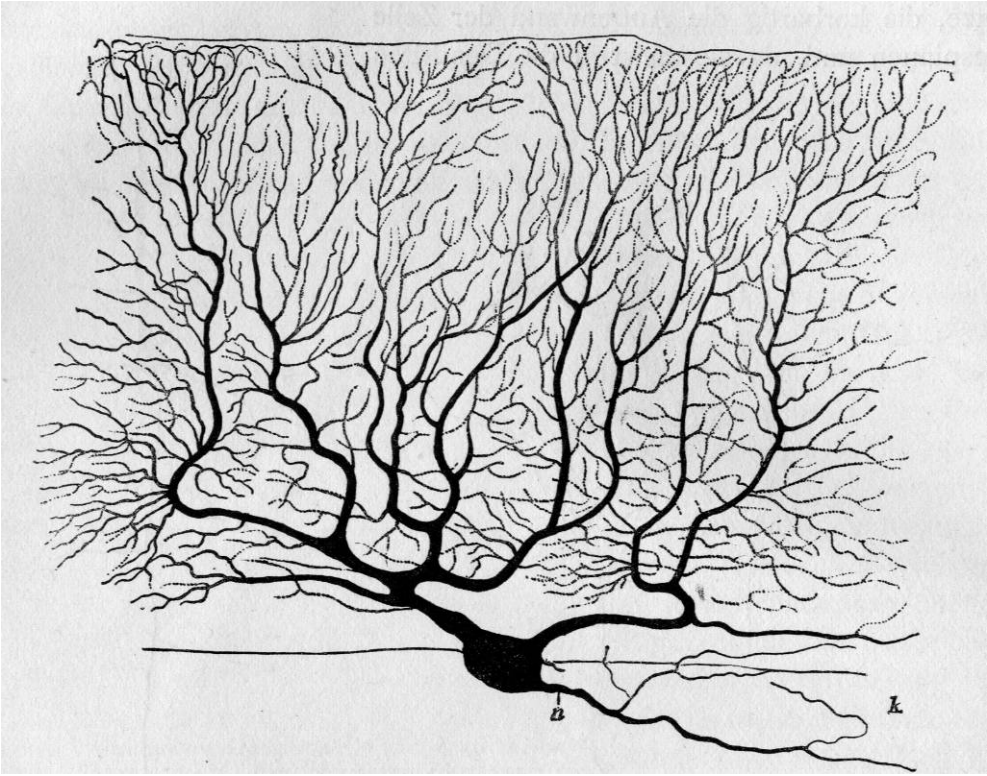
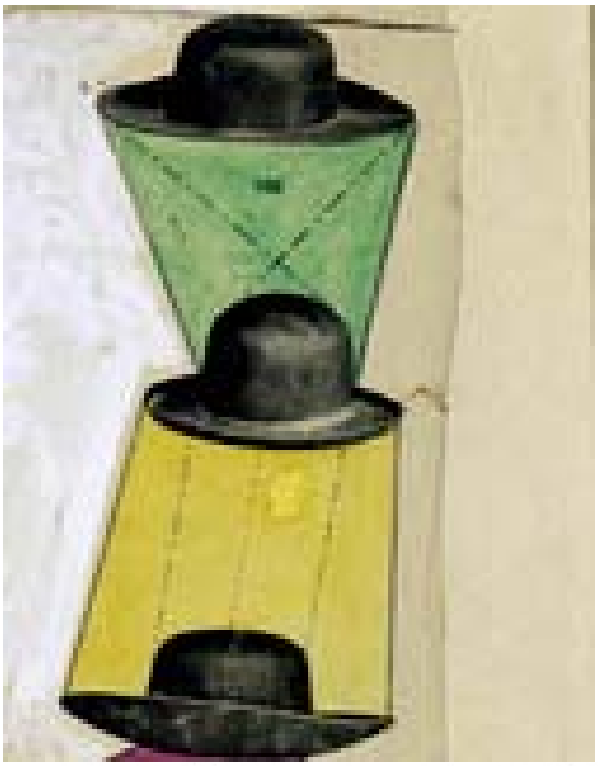


Fig. 44. Illustration showing basic nervous venation [*nervatur*] of dendrites or branch paths from central nerve cell or neurite. After Wundt, *Grundzüge*, sixth edition (1902), trans. Titchener (1904), 44.



A . –	J . – – –	S . . .	2 . . – – –
B – . . .	K – . –	T –	3 . . . – –
C – . – .	L . – . .	U . . –	4 . . . . –
D – . .	M – –	V . . . –	5 . . . . .
E .	N – .	W . – –	6 – . . . .
F . . – .	O – – –	X – . . –	7 – – . . .
G – – .	P . – – .	Y – . – –	8 – – – . .
H	Q – – . –	Z – – . .	9 – – – – .
I . .	R . – .	1 . – – – –	0 – – – – –

Fig. 45. Top: Detail from top right corner of *The Hat Makes the Man*
Fig. 46. Bottom: Alphabet and basic numeric key for International Morse Code

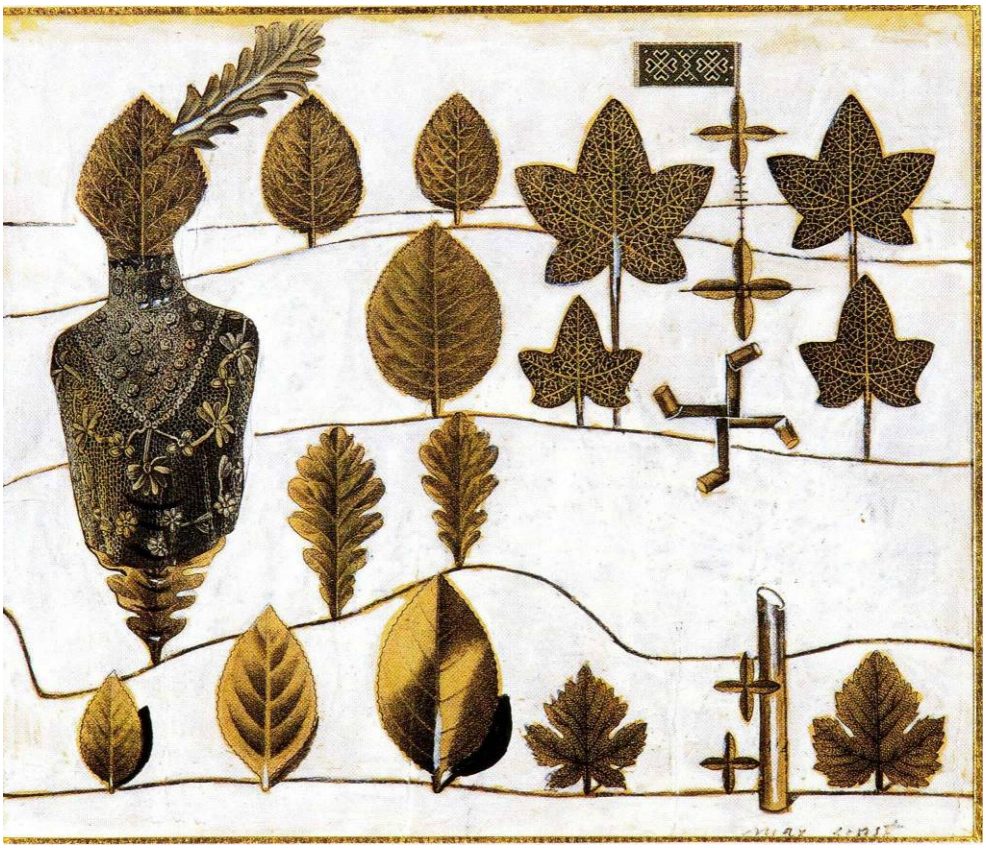


Fig. 47. Ernst, *Leaf Landscape,* 1920. Gouache and ink on printed reproduction, 8 ½ x 10 ¼ in. Paris, Collection Georges Petit. After Camfield, plate 83.

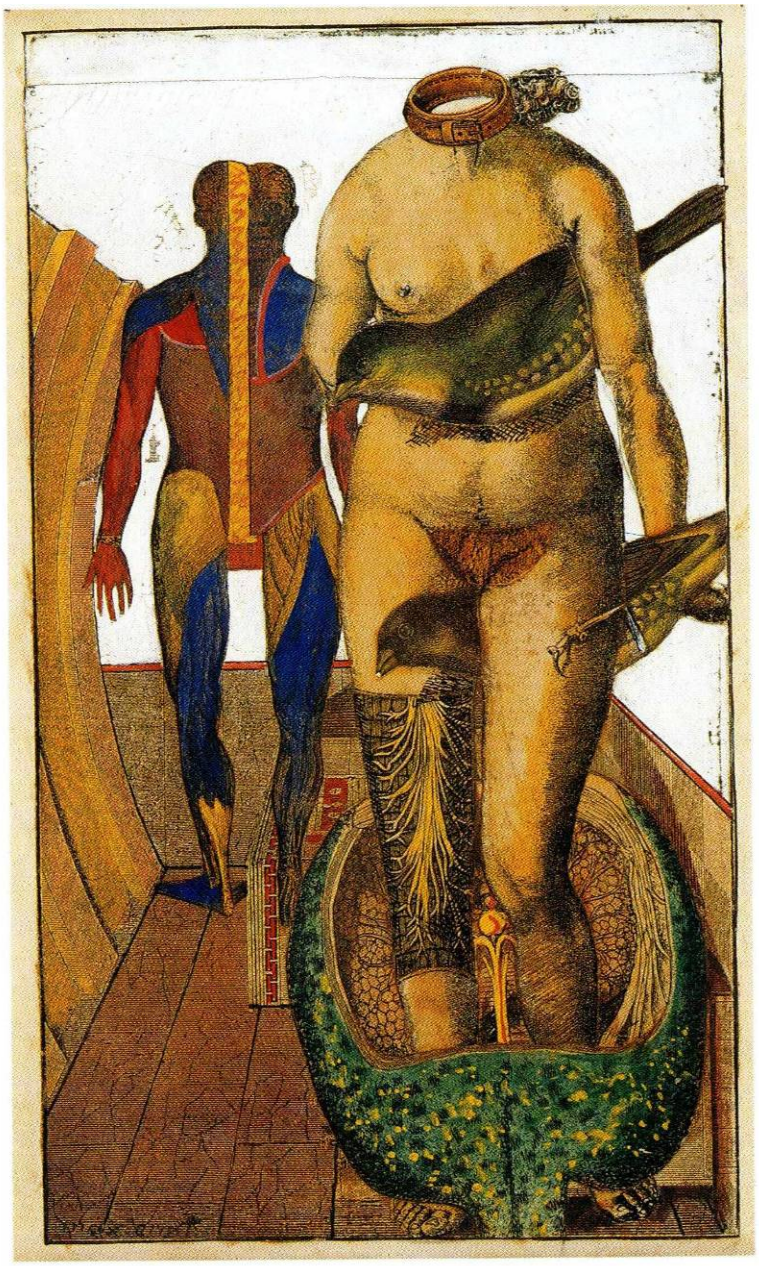


Fig. 48. Ernst, *The Word*, 1921. Gouache and ink on collaged engravings on paper, 7 ¼ x 4 ¼ in. Bern, Kornfeld Collection. After Camfield, plate 108.

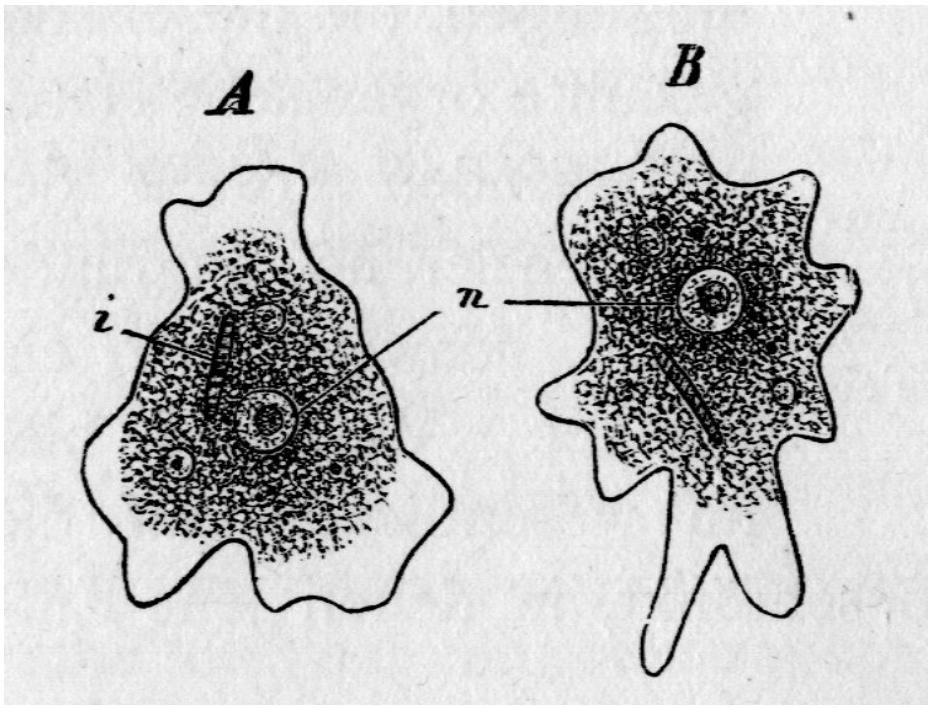


Fig. 49. Illustrations of stages of motion in an amoeba from Wundt, *Grundzüge* (1902), Titchener trans. (1904), 63.

Fig. 50. Binocular stereomicrograph of freshwater hydra. After scienceray.com

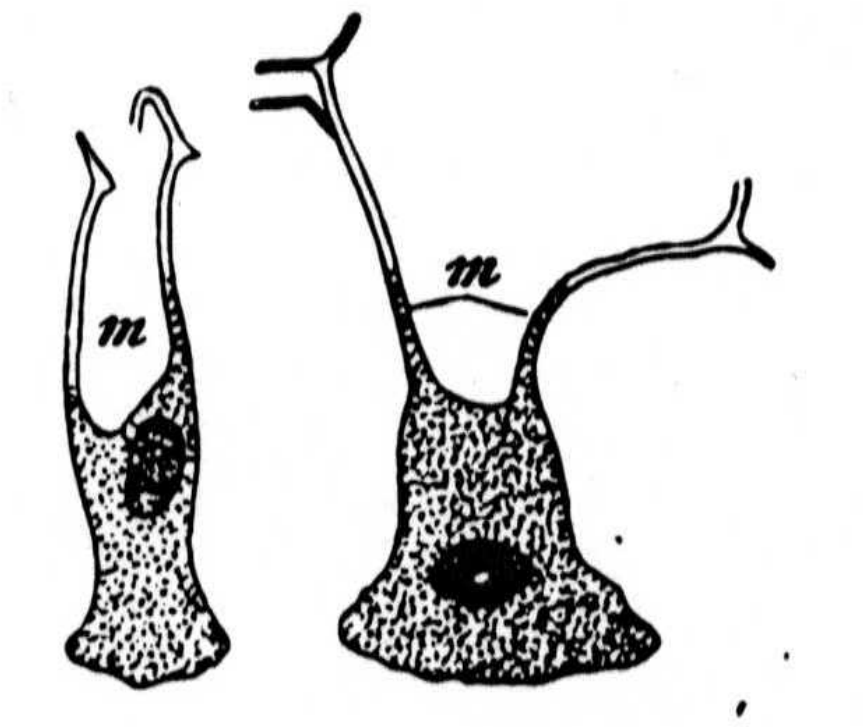


Fig. 51. Illustrations of hydrae from Wilhelm Wundt, *Grundzüge* (1902), Titchener trans. (1904), 35.

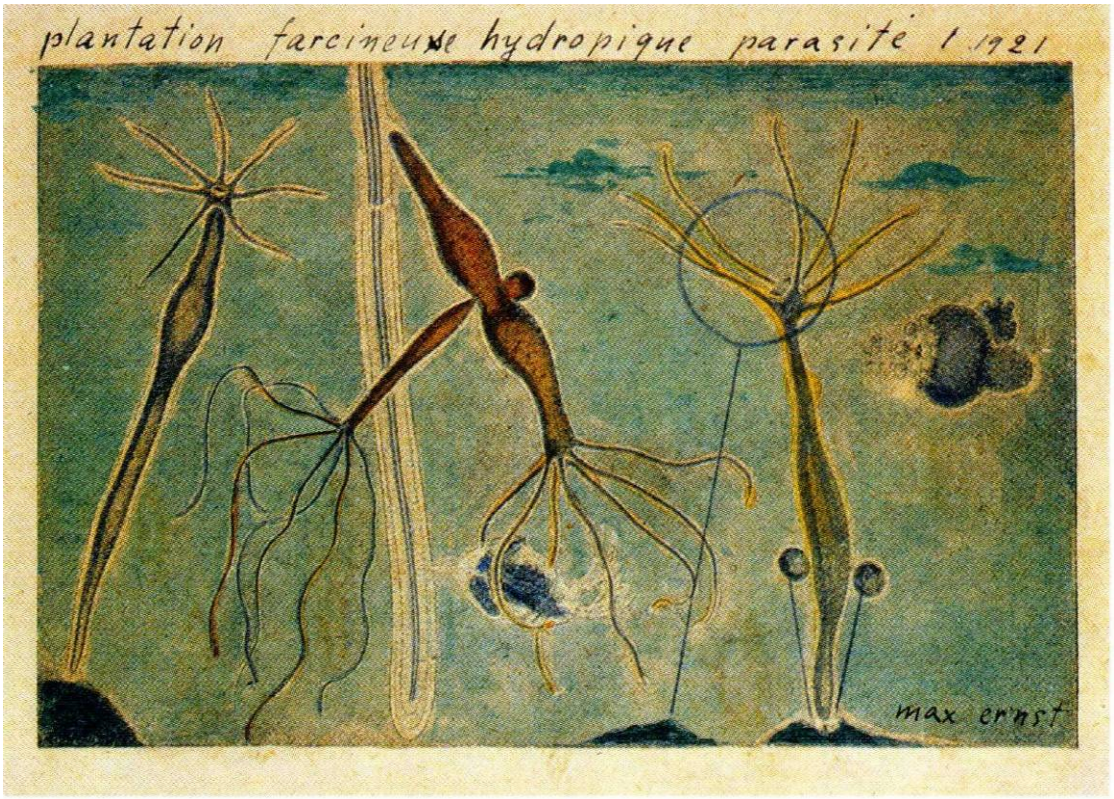


Fig. 52. Ernst, Farcy *Hydropic Parasitic Plantation*, 1921. Watercolor, gouache, and ink on reproduction mounted on paperboard, 3 ¾ x 5 in. Cologne, Galerie Rudolf Zwirner. After Camfield, plate 92.

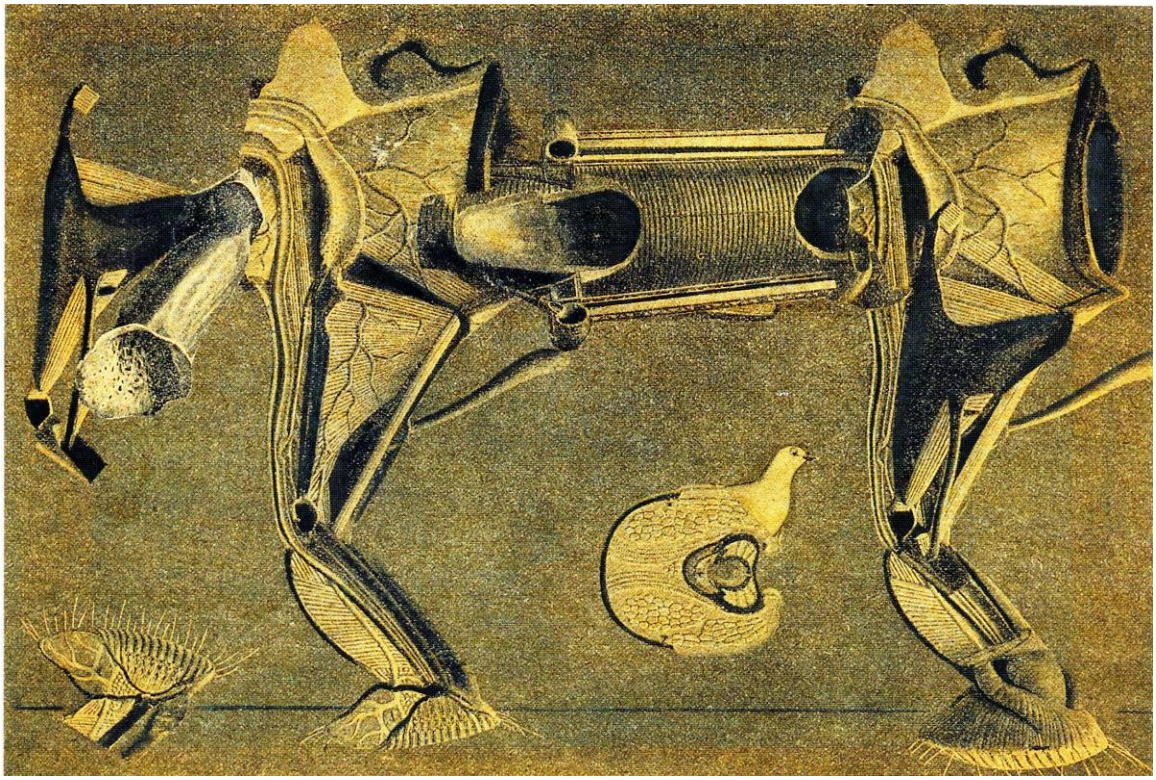


Fig. 53. Ernst, *The Horse, He's a Little Sick*, 1920. Collage and pencil on printed reproductions, 5 ¾ x 8 ½ in. New York, Museum of Modern Art.
After Camfield, plate 79.

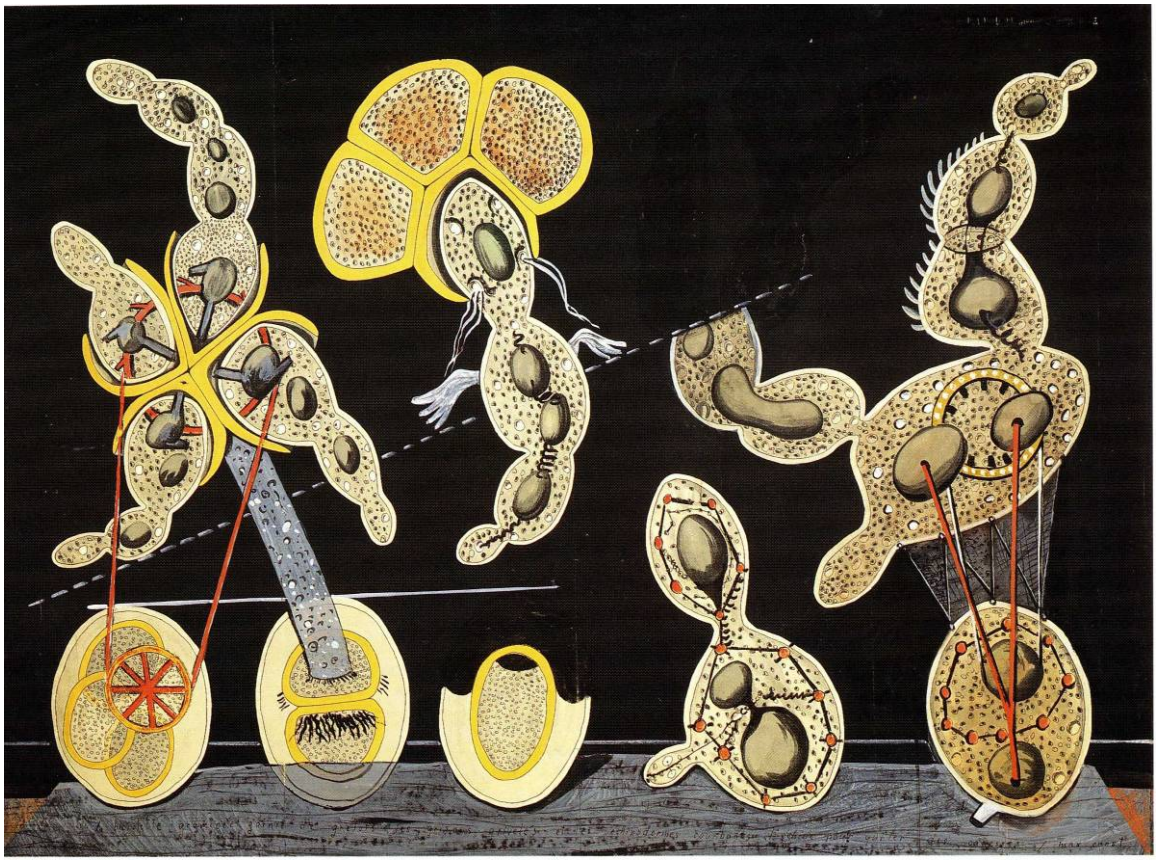


Fig. 54. Ernst, *The Graminaceous Bicycle*, 1920. Gouache and ink on printed reproduction, 29 ¼ x 39 ¼ in. New York, Museum of Modern Art. After Camfield, plate 94.

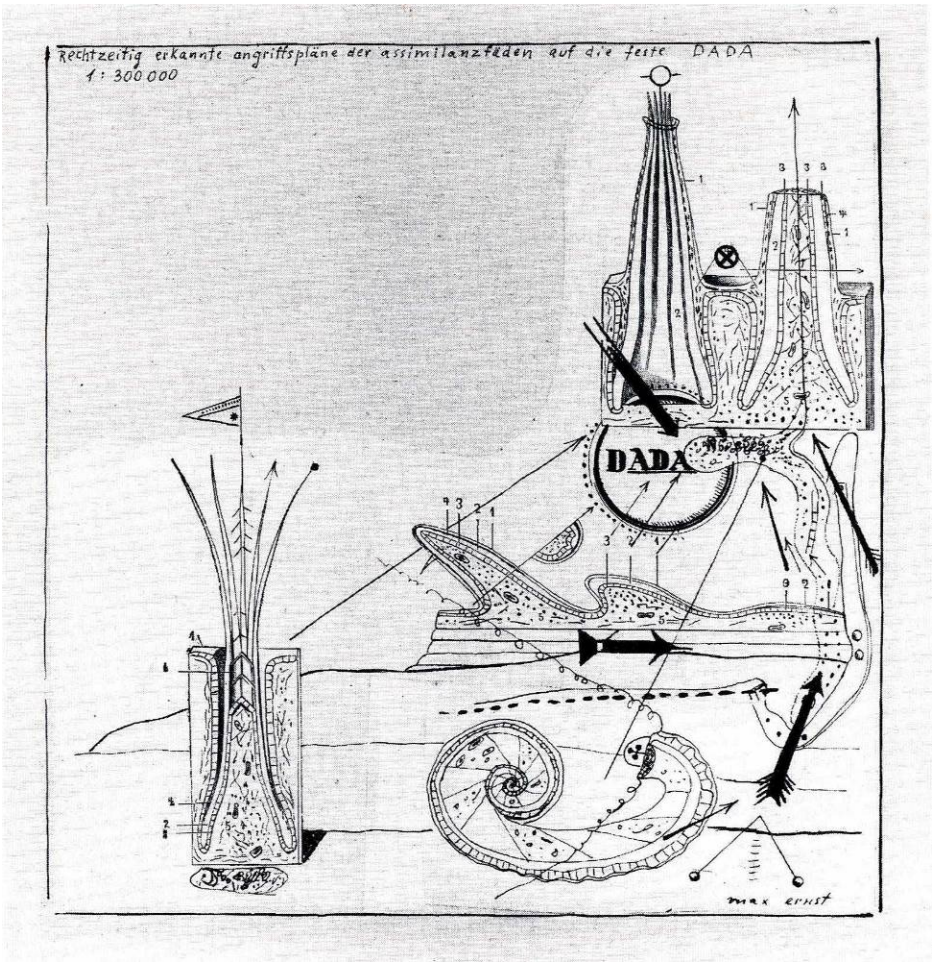


Fig. 55. Ernst, *The Assimilative Threads' Attack Plans Found Out in Time on the Stronghold of Dada, 1:300,000*, 1920. Cut and printed reproduction and ink on paper, 8 x 7 ½ in. Hamburg, Private collection. After Camfield, plate 86.

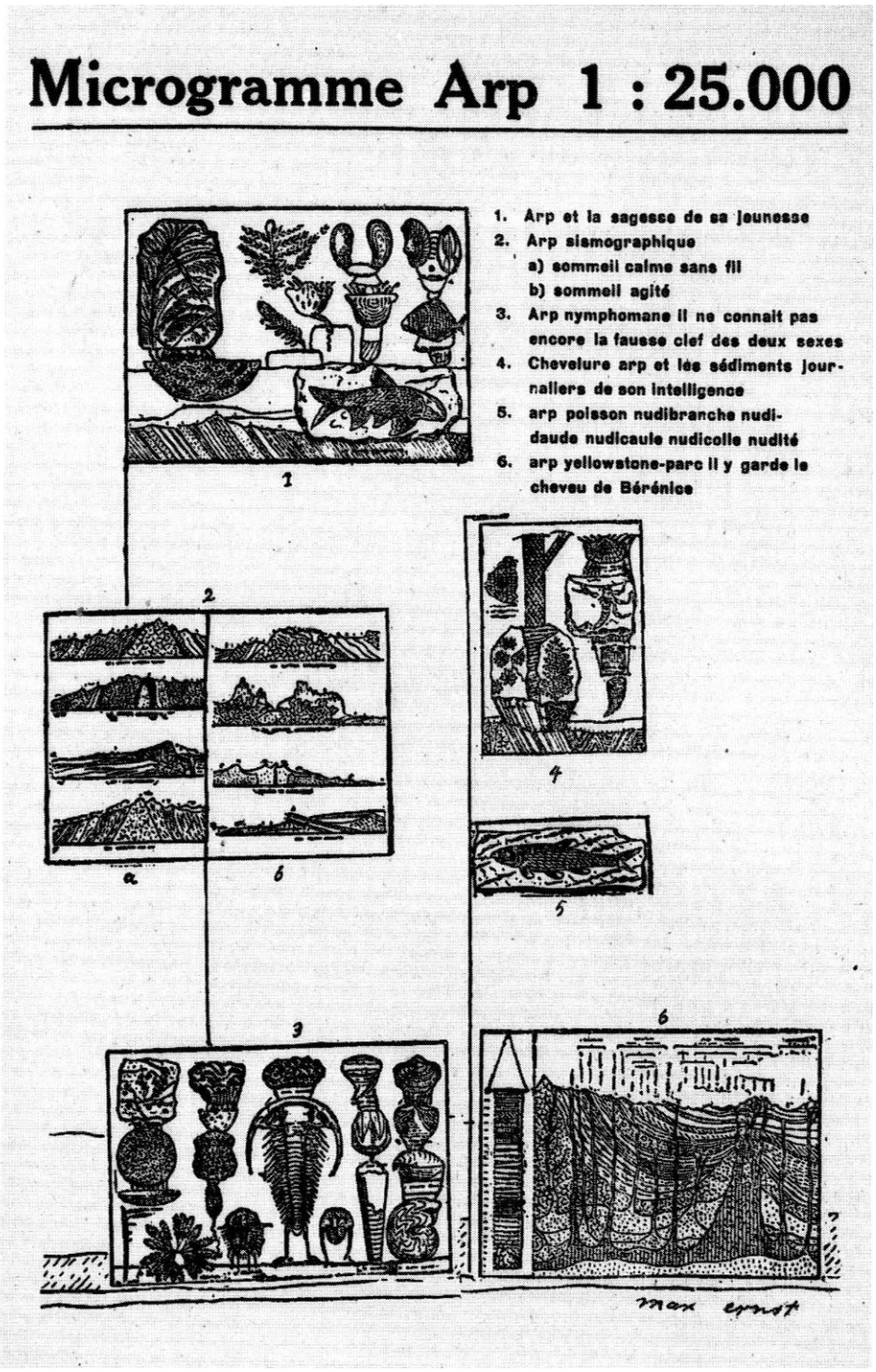


Fig. 56. Ernst, *Microgramme Arp*, 1921. Original lost, reprinted in *Littérature*, May 1921. Original dimensions and media unknown. After Ades (2003), page 207.

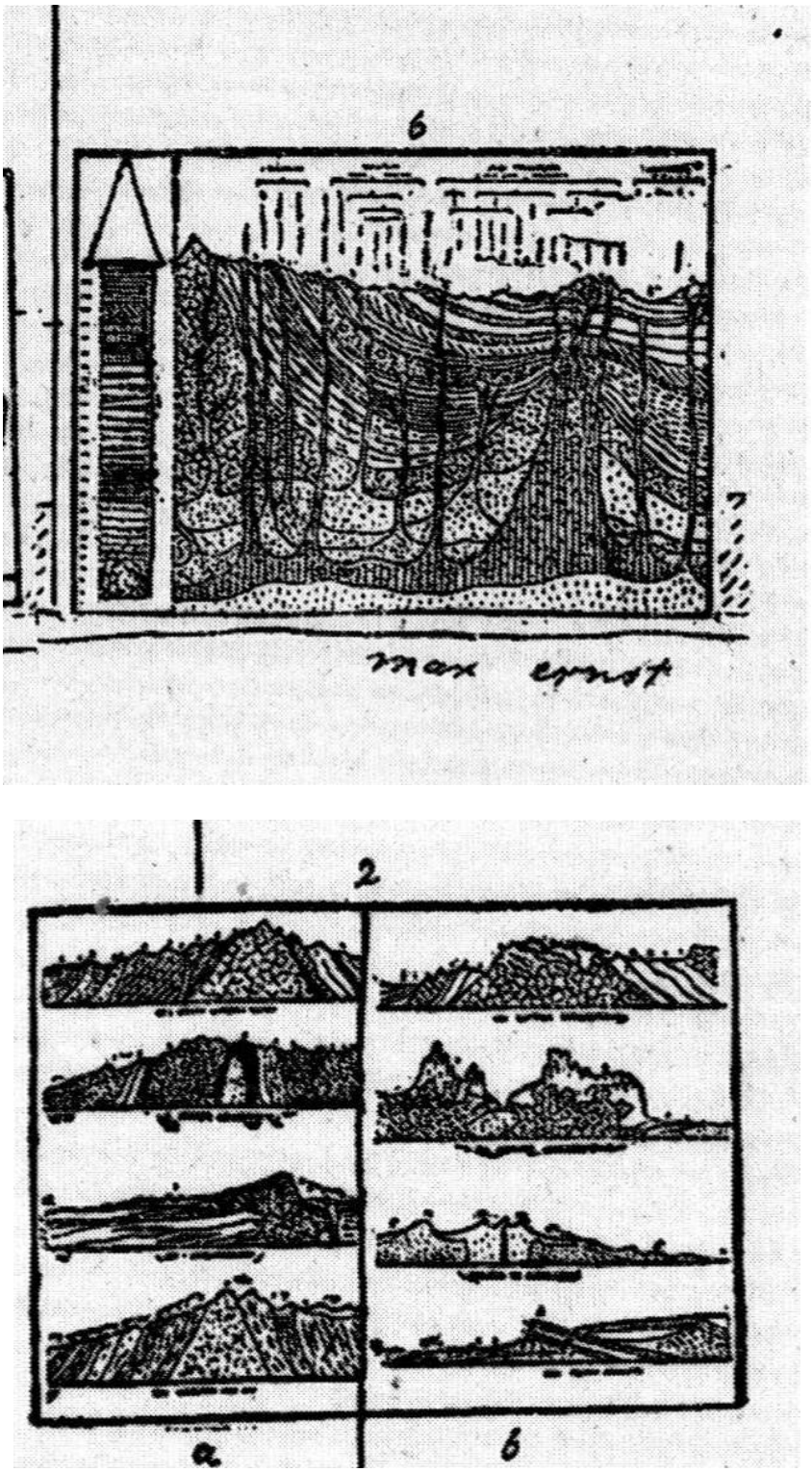


Fig. 57. Two details from the *Microgramme Arp* showing appropriated geological cross-sections

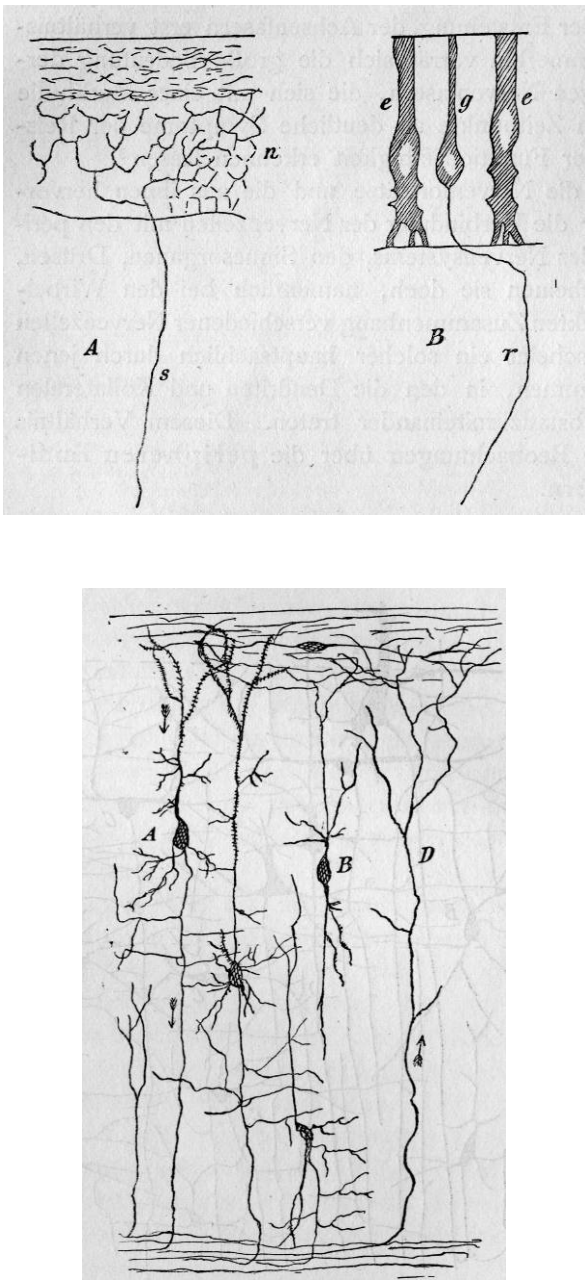


Fig. 58. Two illustrations of histological cross-sections of human anatomy and nerves from Wundt, *Grundzüge* (1902), Titchener trans. (1904). Top: typical forms of sensory nerve termination (page 47); Bottom: centromotor cells (page 221).

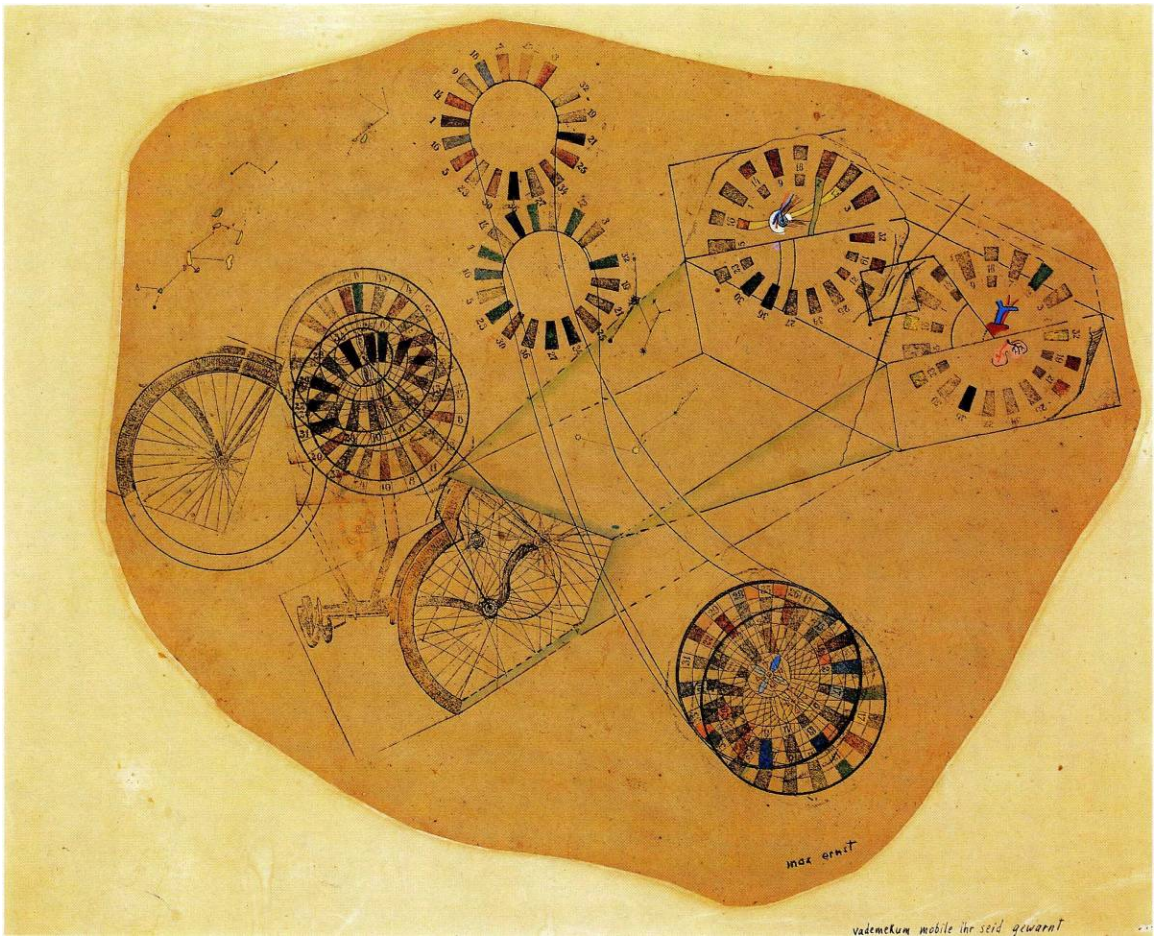


Fig. 59. Ernst, *Vademekum Mobile You are Warned*, 1919-1920. Stamps of printer's blocks with ink, watercolor, and gouache on paper mounted on paper, 16 ½ x 21 in. Private collection. After Camfield, plate 41.

Fig. 60. Max Ernst and Hans Arp, *Physiomythological Flood Picture*, 1920. Gouache, pencil, and ink on collaged photographs and reproductions, 4 ½ x 4 in. Hanover, Sprengel Museum. After Camfield, plate 75.

Fig. 61. Jacques-Louis David, *Antoine-Laurent Lavoisier (1743-1794) and His Wife Marie-Anne-Pierrette Laulze (1758-1836),* 1788. Oil on canvas, 102 ¼ x 76 ⅝⅝ in. New York, Metropolitan Museum of Art. Courtesy Metropolitan Museum of Art.

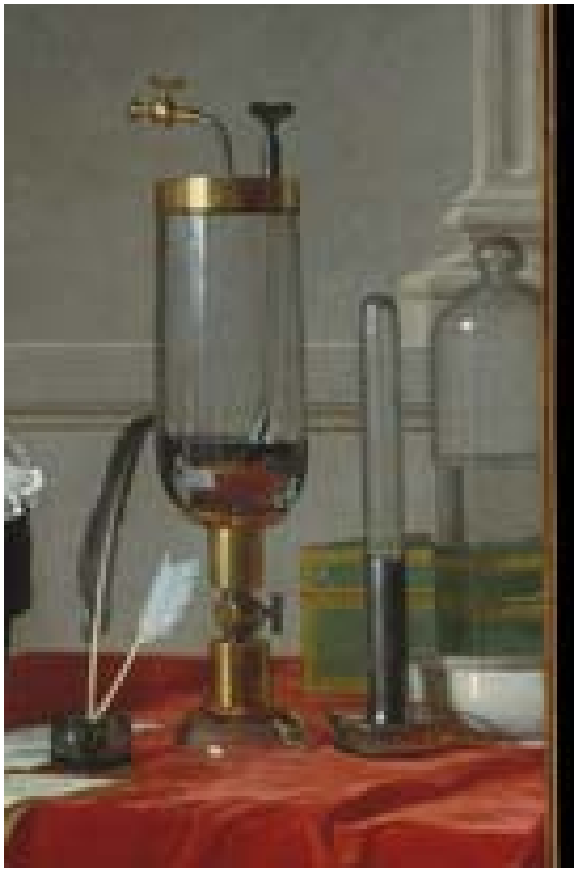


Fig. 62. Detail from David's portrait of Lavoisier showing gasometer and other pneumatic instruments.

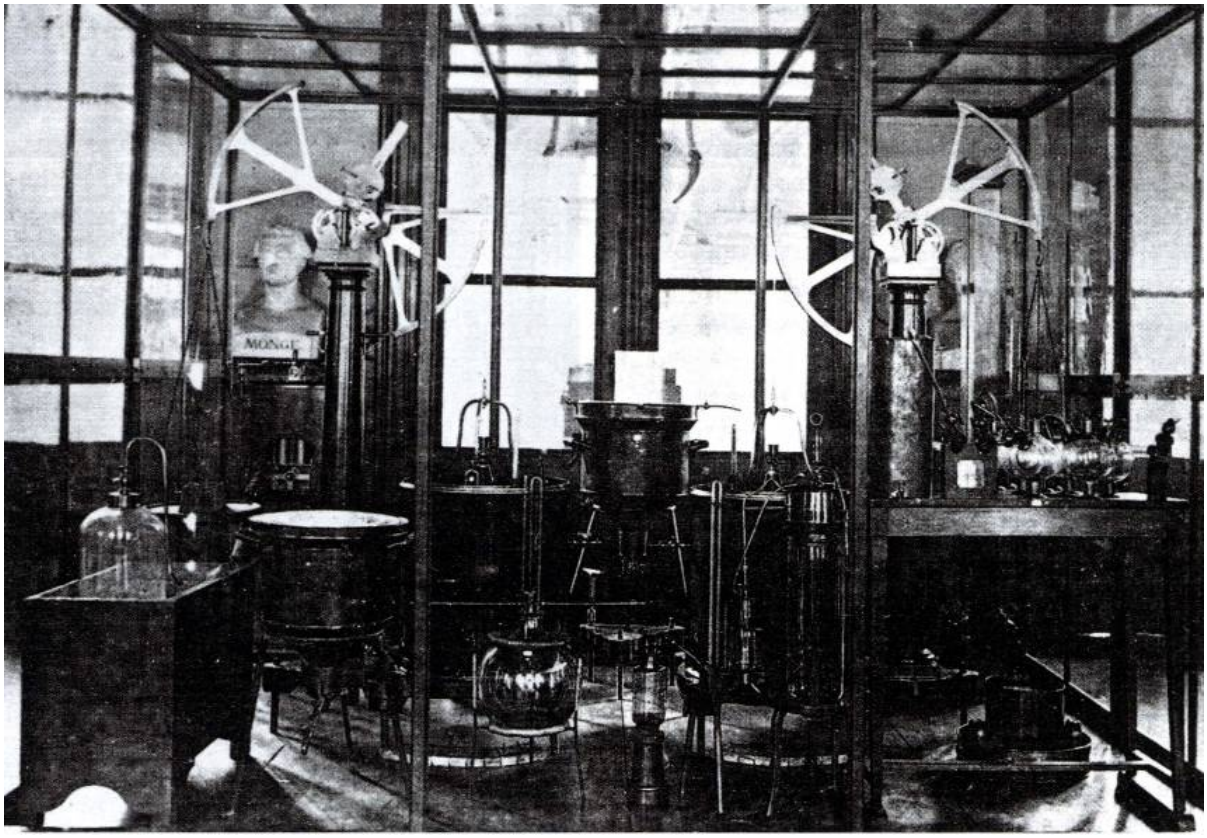


Fig. 63. Postcard showing Lavoisier's gasometers on display at Conservatoire National des Arts et métiers, Paris, c. 1900. Collection of the author.

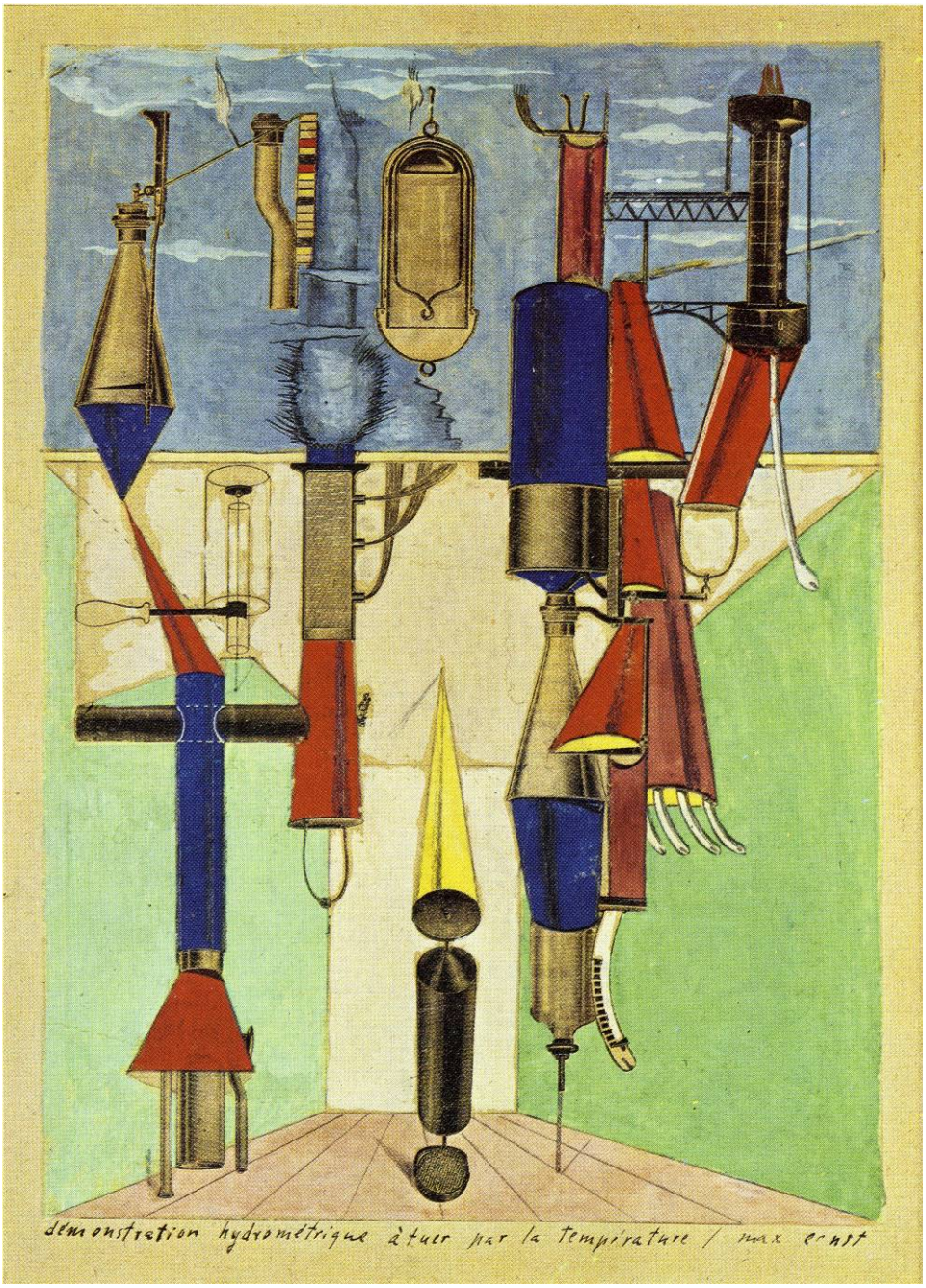


Fig. 64. Ernst, *Hydrometric Demonstration of Killing by Temperature*, 1920. gouache, ink, and pencil on printed reproduction, 9 ½ x 6 ½ in. Private collection. After Camfield, plate 54.

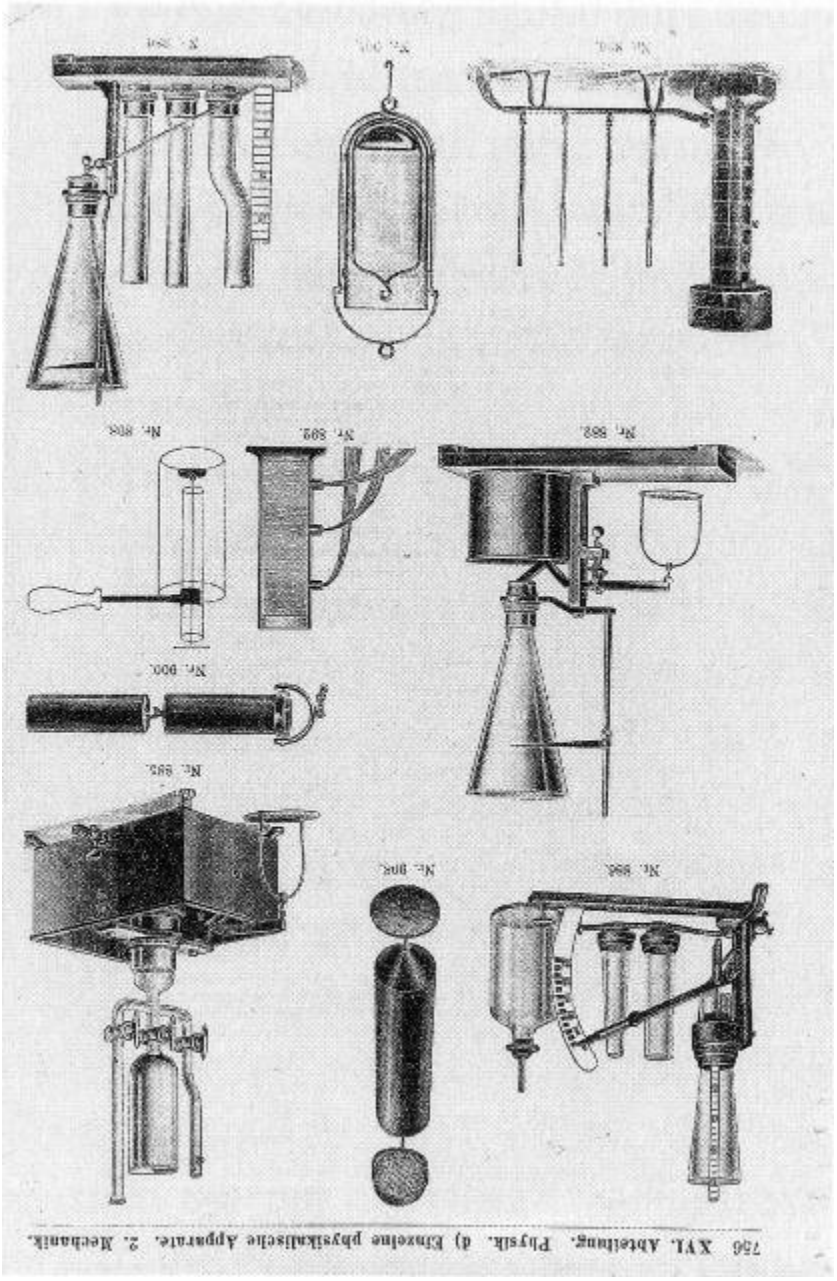


Fig. 65. Page illustrating chemical apparatus from *Bibliotheca Paedagogica* (1914), page 756 (image inverted to show adaptation by Ernst). After Camfield, page 337.

Fig. 66. *Exposition Universelle*, Paris, 1900; Vitrine commemorating Lavoisier.
After Beretta, fig. 5, page 10.

Fig. 67. Statue of Lavoisier in front of *Église de la Madeleine*, 1906. (Destroyed by Nazis, 1943). After Beretta, fig. 4, page 58.

Fig. 68. Ernst, *Here Everything is Still Floating*, 1920. Collaged reproductions and pencil, 4 1/8 x 5 in. New York, Museum of Modern Art. After Camfield, fig. 58.

Fig. 69. Ernst, *Laocoon*, 1920. Original presumed lost, reproduced in Hans Richter, *Dada: Art and Anti-Art*, 67.

Fig. 70. Hagesandros, Polydoros, and Athanadoros of Rhodes, *Laocoön and His Sons, c. 40 BC* . Marble height 8 ft. Rome, Vatican Museum.

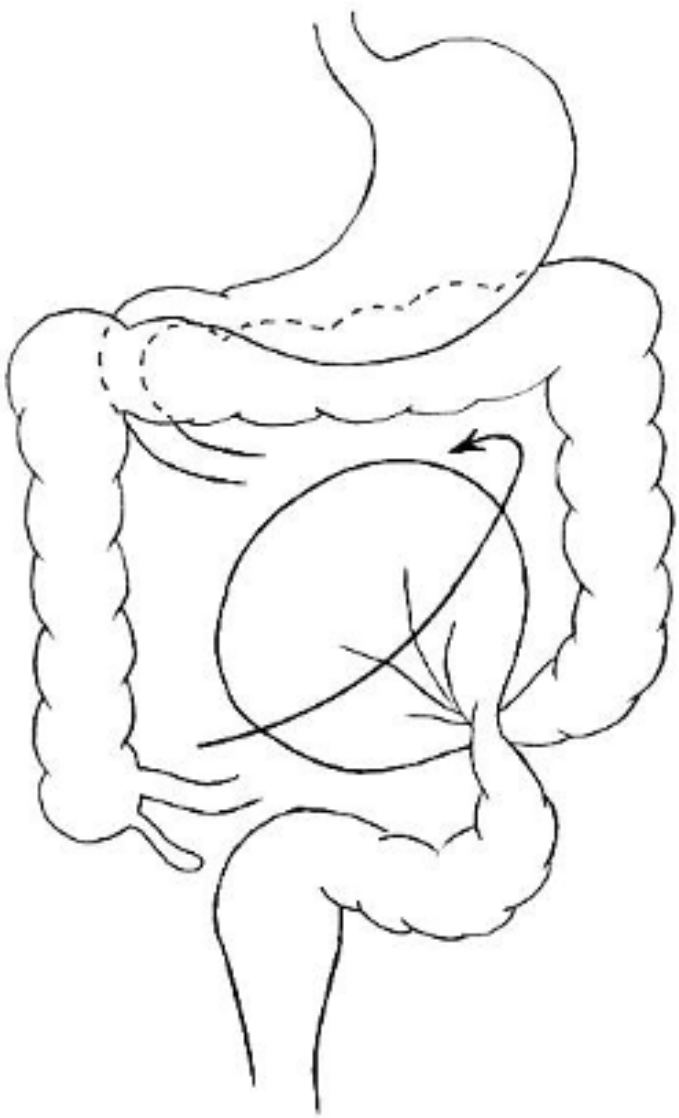


Fig. 71. Illustration of sigmoid volvulus, showing intestinal swelling. After University of Hawaii, Burns School of Medicine, http://www.hawaii.edu/medicine/pediatrics/pemxray/v2c08.html

DADA
INTIROL
AUGRANDAIR
DER SÄNGERKRIEG

TARRENZ B. IMST 16 SEPTEMBRE 1886—1921 1 FR. 2 MK.
EN DEPOT AU SANS PAREIL 37 AVENUE KLÉBER PARIS

MAX ERNST: Die Leimbereitung aus Knochen
La préparation de la colle d'os

SAUBERREINKLARNETTO

Einer unserer Freunde aus New-York erzählt, er kenne einen literarischen Taschendieb; sein Name sei Funiguy, berühmt als Moralist, genannt musikalische Fischsuppe mit Reiseeindrücken.

Tzara schickt an Breton: einen Karton gefüllt mit in Straußenmilch konservierten Erinnerungen und einer batavischen Träne, die mit Angaben für ihre Verwandlung in Bienenpuder versehen ist. Er wird in Tarrenz b. Imst vom morganatischen Gelächter der Ebenen und Wasserfälle erwartet.

Die Überschrift dieses Journals stammt von Maya Chrusecz.

Wir kochen geneigte Herrschaften in Paraffin und hobeln sie auf.

Arp schraubt S.G.H. Taeuber auf den Stamm einer Blume.

Im Katalog des Salon Dada findet sich ein Irrtum, den wir unbedingt berichtigen müssen. Das mechanische Bild von **Marcel Duchamp**, »Braut«, ist nicht mit 1914 datiert, wie man uns weismachen wollte, sondern mit **1912**. Dieses **erste mechanische Bild** wurde in München gemalt.

Die Baronin Armada von Duldgedalzen, bekannt in der Geschichte unter dem Namen Die Grausame, hat vor Gästen, auf ihren Gütern in Tarrenz, ein Massaker unter den Bauern der Umgebung veranstaltet.

Jetzt wo wir verheiratet sind, mein lieber Cocteau, werden Sie mich weniger sympathisch finden. In Spanien schläft man nicht mit seinen Familienmitgliedern, würde Marie Laurencin sagen.

Tzara schickt Soupault: 4 Walfische aus Schaumgummi, 2 Nadeln zum Vergiften der Bäume, einen unübertrefflichen Kamm mit 12 Zähnen, ein aufgeregtes lebendiges Lama und einen mit Kadaverschinken geschmorten Apfel. Für Mic die Grüße seines Offenherzigen.

Arp schickt Eluard: einen Turban aus Eingeweiden und die Liebe zu 4 Zimmern. An Benjamin Péret: gesottene Minerale, Ameisenhaufenfahnen und Perückenattrappen auf dem mit Mäusehuren gekrönten Postkutschenverdeck.

Funiguy hat 1899 den Dadaismus, 1870 den Kubismus, 1867 den Futurismus und 1856 den Impressionismus erfunden. 1867 traf er mit Nietzsche zusammen, im Jahr 1902 bemerkte er, daß das nur ein Pseudonym für Konfuzius sei. Im Jahr 1910 errichtete man ihm ein Denkmal auf dem tschechoslowakischen Concorde-Platz, da er fest an die Existenz von Genies und die Wohltaten des Glücks glaubte.

Tzara schickt Marcel Duchamp: in negerschwarzen Whisky getauchte Liebesbonbons und einen neuen mit lebendigen Jungfrauenschenkeln versehenen türkischen Diwan.
An Man Ray: eine durchsichtige Ansichtskarte mit den Bergen und allem übrigen und einen Kühlschrank, der beim Herannahen eines Anlassers französisch spricht.
An Marguerite Buffet: ein Paket Schokolade à la Knopfloch sowie 3 Musiknoten von ganz und gar ungewöhnlicher Qualität.

Paris (16), 12 rue de Boulainvilliers.

TRISTAN TZARA

Fig. 72. Cover of *Dada Outdoors The Singers' War in the Tirol*, September 1921. After Camfield, fig. 76.

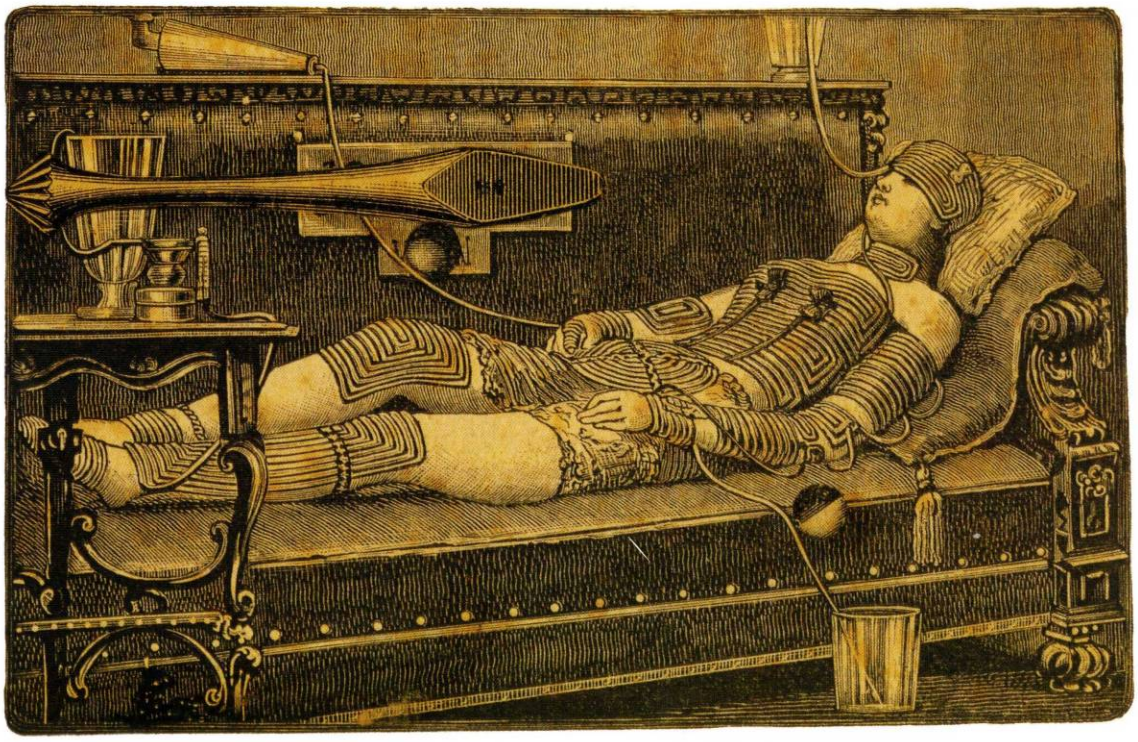


Fig. 73. Ernst, *The Preparation of Bone Glue*, 1921. Collage of engravings and ink on paper, 2 ¾ x 4 3/8 in. Private collection. After Camfield, plate 106.

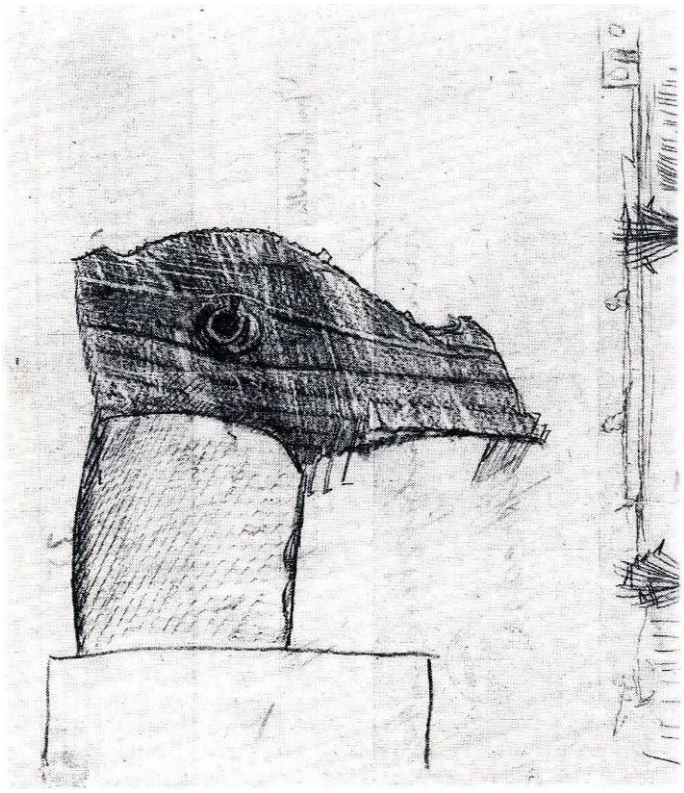


Fig. 74. Ernst, *Animal Head on Pedestal*, 1921. Pencil rubbing on paper, 8 ¾ x 7 ¼ in. Basel, Öffentliche Kunstsammlung, Kupferstich-Kabinett. After Camfield, fig. 75.

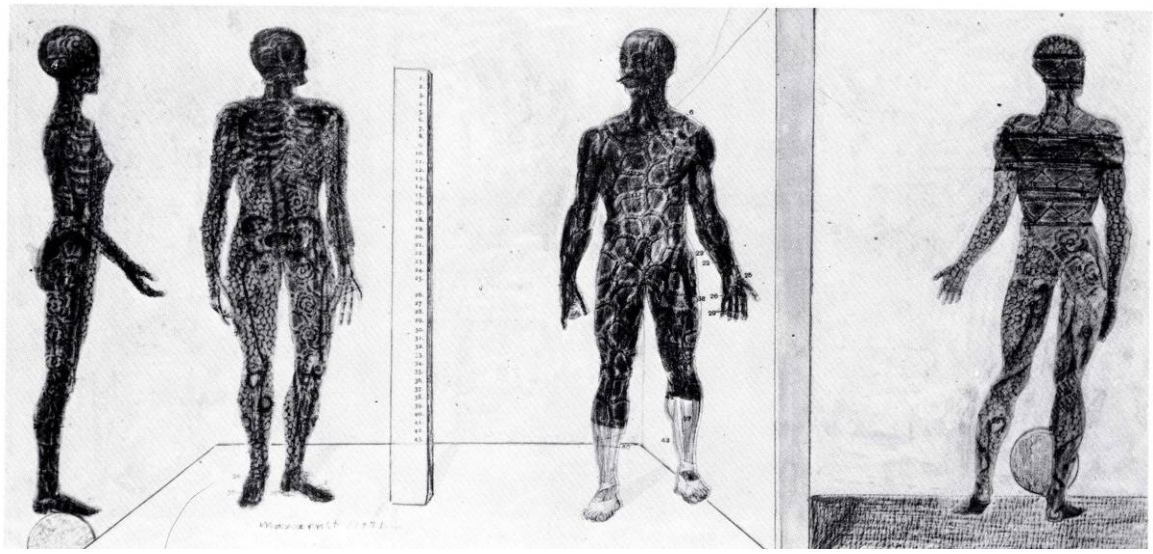


Fig. 75. Ernst, *Trinity of Anatomy*, 1921. Pencil rubbing on paper, 18 x 36 cm. Paris, Private collection. After Spies, *Max Ernst: Collages*, fig. 223.

Fig. 76. Flyer advertising Max Ernst exhibition in Paris at Au Sans Pareil gallery and bookstore. After Camfield, fig. 50.

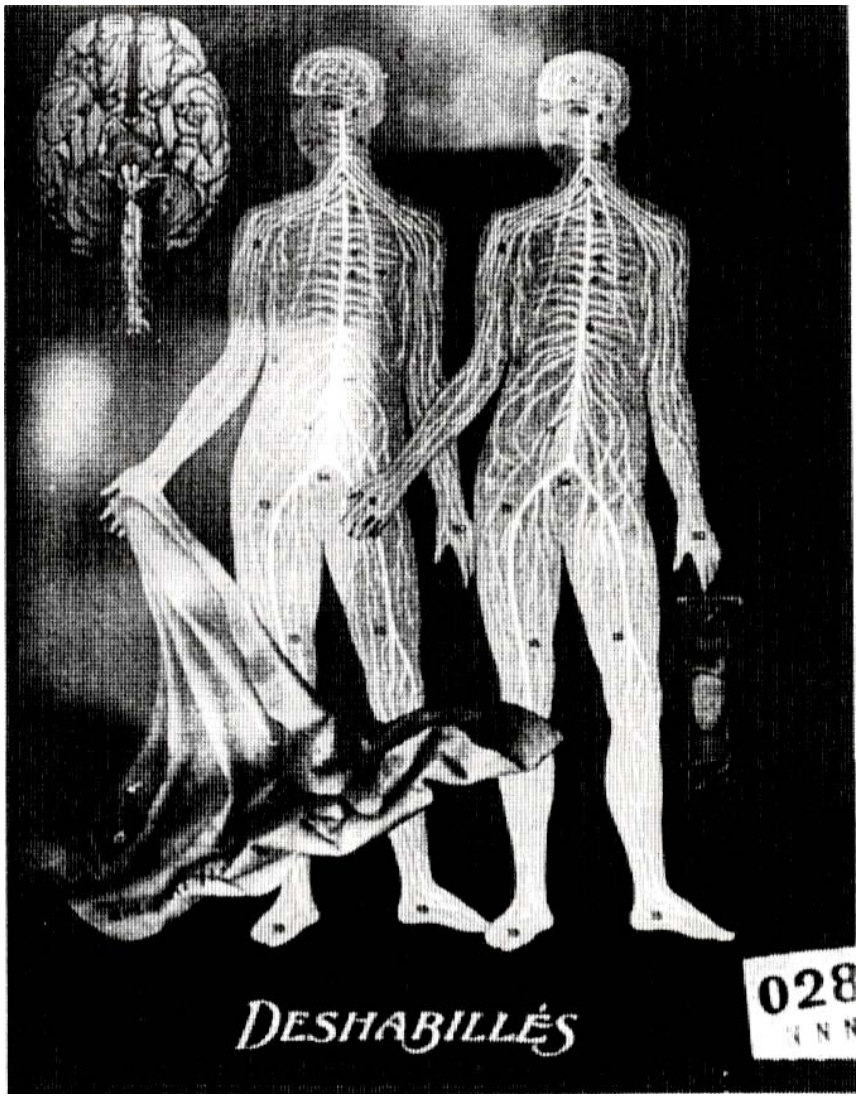


Fig. 77. Ernst, *Déshabillés*, c. 1920. Collage, dimensions unknown. Current location unknown. After Derenthal, *Max Ernst*, fig. 322.

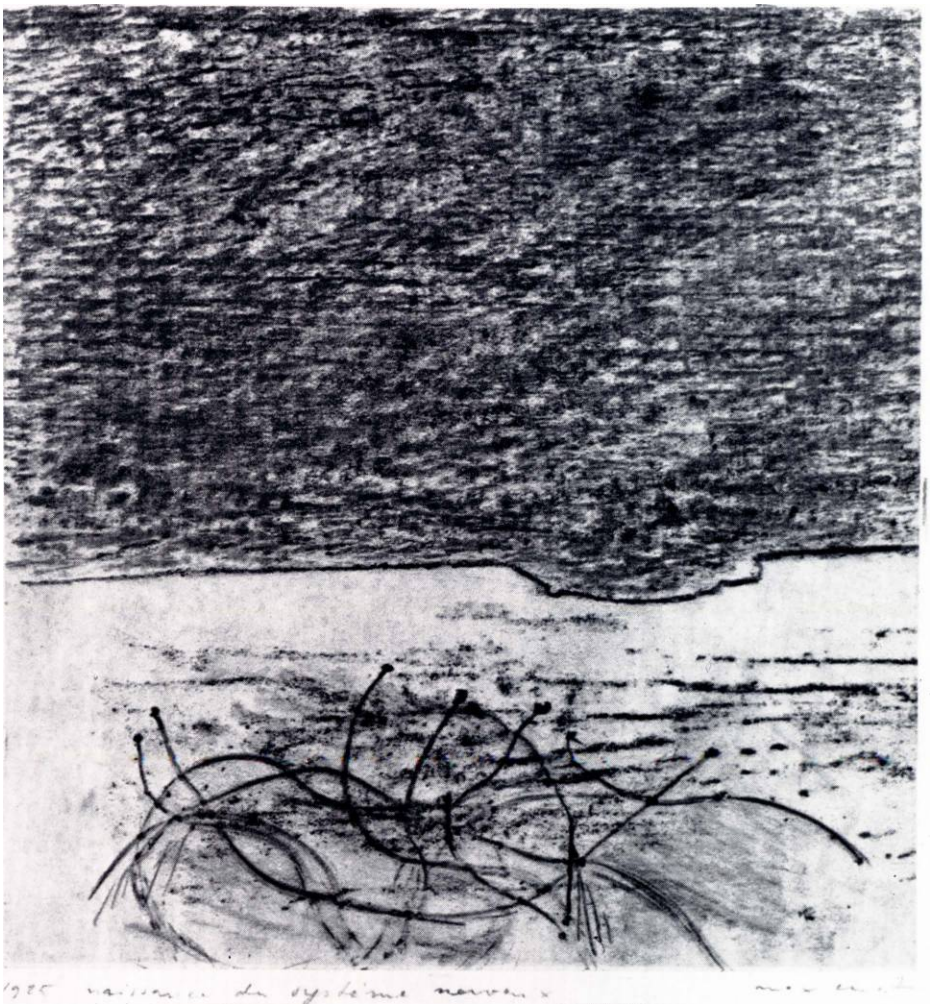


Fig. 78. Ernst, *Naissance du système nerveux*, 1925. Pencil rubbing on paper, 15 x 14 cm
Formerly collection Eluard, Rene Gaffe, and Galerie Berggruen. Paris, Private collection.
After Spies, *Max Ernst: Werke*, vol. 3, no. 831, page 21.

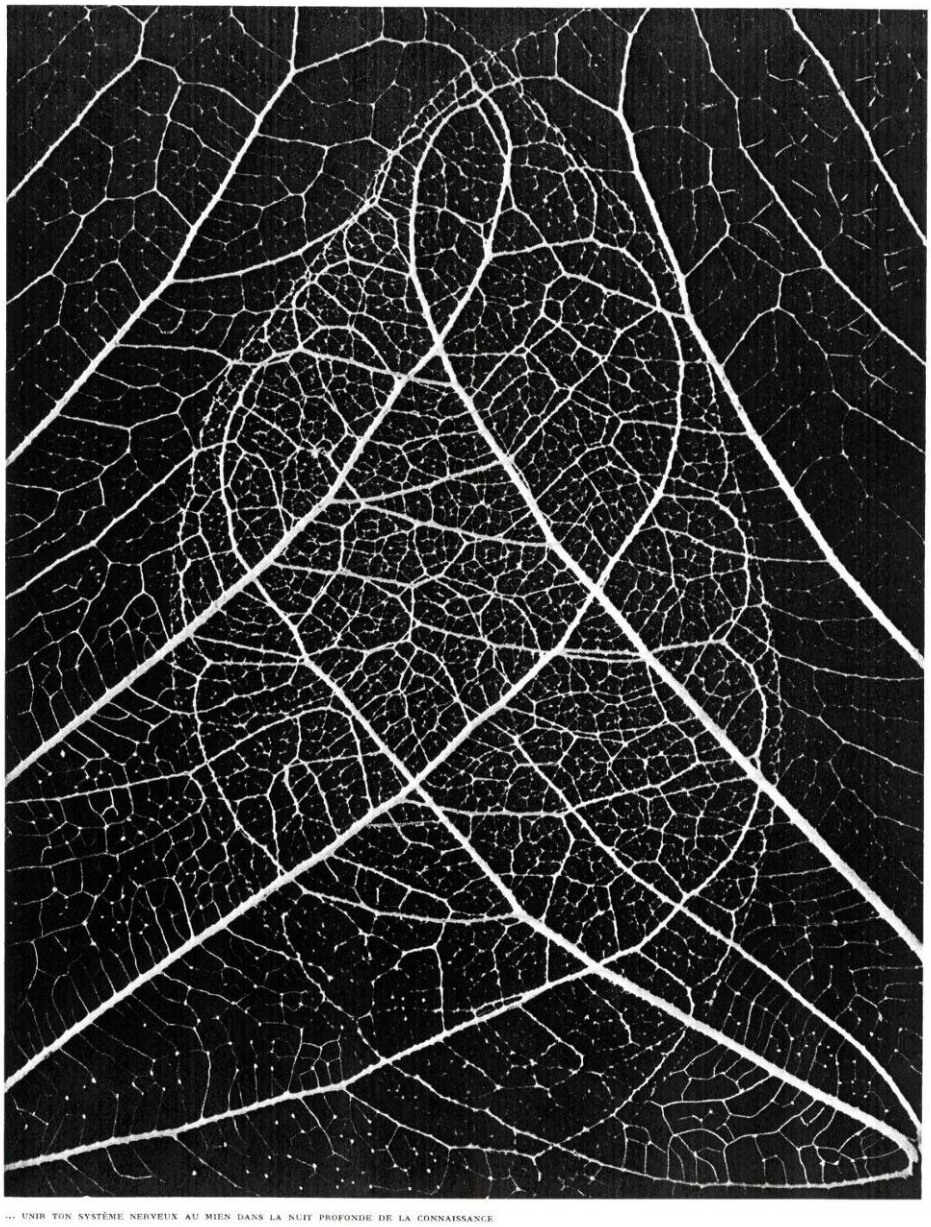


Fig. 79. Ernst, *Unir ton sytseme nerveux au mien dans la nuit profonde de la conaissance*, 1936. Photogram reproduced in *Minotaure* no. 8 (1936).

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